WITH an apology to our subscribers, we break away from our usual efforts in this column to mention a gauge,—the gauge of circulation of a publication. Yet on second thought, our subscribers are vitally interested in this subject; not only would there be no such gauge for this paper without them, but the rough draft of this matter that we have before us presages an honest compliment or two before we reach the tenth inch of this space.

The value of paid circulation is *not* overestimated. It is the most important seal of approval that can be placed upon any publication. There are today, however, four weak points in evaluating most publications "net paid totals": totals are overemphasized, quality is secondary to quantity, publishers consider subscribers en masse instead of as individuals, and too many subscriptions are "forced."

We haven't just picked these objections because we happen to be different. They are becoming the consensus of opinion. Seven figure circulation looks imposing, but a popular weekly has it and starves for advertising. Five figure circulation may often be the result of high-powered solicitation, of no permanent value to anyone.

As has always been the case, the quality subscribers never need to be sought out. That their business is the paper's and the paper's business theirs is sufficient drawing power, and if such individuals remain *personal* to the publisher, every particle of mutual benefit can be secured.

We don't happen to be writing this with our thumbs in our vest. We did think our own subscribers would like to know, publicly, how we regard them.

The Publishers

PLASTICS
& MOLDED PRODUCTS

REG. U. S. PAT. OFFICE

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 6 JULY, 1930 No. 7

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PLASTICS

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A periodical devoted to the manufacture and use of plastic and composition products

Vol. 6 JULY, 1930 No. 7

Industrial Fumes and Vapors and Their Effect on Synthetic Resin Products

Qualitative and Quantitative Experiments on actual molded goods shows their high resistance to acids, gasoline and chlorine

By Dipl. Ing. R. Reichherzer and F. Deutsch
of Spremberg, Germany

EARLY in the present year, we reported in PLASTICS the results of a series of tests of molded products under the combined influence of electrical charges and acid and alkaline gases. (PLASTICS, 1930, Vol. 6, p. 11). There were described tests made by the Kontakt-Roemmler concern on molded products that were submitted to hydrochloric acid and ammonia fumes in special testing cabinets. These cabinets have been in constant use since November 1928, and sufficient data has been accumulated from which to draw some definite deductions relative to the resistivity of molded products under the influence of the gases and fumes encountered in commercial practice.

In many industries the electrical fittings suffer considerably from the effects of fumes and moisture, being rapidly corroded and destroyed. The remarkable resistance of molded fixtures to such gases as chlorine, nitric oxide etc., is shown by the experiments described in this article.

The same is taken by special permission from Kontakt-Roemmler Nachrichten, March, 1930; a private publication of the Kontakt A. G. and H. Roemmler A. G., of Germany.

Very Resistant

It may be stated right at the start, that despite the fact that the molded insulation has been subjected to strong acid as well as ammonical fumes for a period of more than a year, that none of it has been destroyed nor deleteriously affected, while metallic inserts and parts have been completely corroded and destroyed in the same period right alongside of the molded parts. The great superiority of molded material as compared with metals is thus made evident.

So many responses have been received from practical workers in this field, relating to experiences of a similar nature that it was deemed advisable to carry out some more work along these lines.

Severe Tests

As it was obviously impossible to put up a special chamber for each reagent, gas or fume to be studied, a simplified but good comparative testing method was worked out. The tests in most cases were rendered more severe by the simultaneous presence of water, or of moisture, as this would aid any electrolytic or hydrolytic changes. In the case of acid fumes, the presence of moisture is particularly apt to aid the destruction and corrosion of any substance capable of being attacked by the fumes. Among the acids used in the test, the very strongest ones

were purposely chosen, as it might be assumed that weaker acids, such as fruit acids etc., wohld not affect a molded product if it proved to be resistant to the stronger mineral acids. The following arrangement was employed for carrying out the tests:—

Method Used

A glass vessel, commonly known as a dessicator, was used. This was provided with a glass cover that fitted the vessel with a ground joint. The dessicator was about 20 centimeters in diameter and 25 centimeters high. About halfway between the bottom and the top, on suitable supports, the test-pieces were supported, while the bottom of the dessicator contained a layer of the liquid whose fumes were to act upon the test-pieces. This subjected the articles to the fumes arising from the liquids, without having the articles in actual contact with the liquid itself. In some instances, provision was made for passing a gas into the dessicator; or glass tubes for introducing chemicals capable of developing a gas from the dessicator were provided. In order to approximate practice as near as possible fully mounted molded pieces or apparatus were employed for carrying out the tests. Some of these were the water-proof type of insulating apparatus manufactured (in Germany) by the Kontakt-Aktien Ges., of Rödelheim, near Franfurt on the Main. These were provided at the point where wires were supposed to enter with the usual cable-insulation mass that was poured into place. Besides this, special normal test-pieces of the insulating material were also subjected to the same fumes in order to obtain quantitative results. These test pieces were furnished by the H. Roemmler A.-G., and were 120 x15x10 mm. in dimension.

In such cases were the nature of the material used to make the fumes was without known action on the metallic parts of the apparatus, it was not found necessary to seal up the wire-entering openings with the cable-sealing mass already mentioned. Such substances were benzine, acetone, trichloroethylene and the German standard motor fuel (Reichskraftstoff; which is a sort of benzene-alcohol mixture).

ed pieces, where there were metallic parts, was prevented by sealing up the usual openings left for the wires by means of cable-sealing composition, so that any effect on the metallic parts would have to arise from fumes that worked their way

TABLE I

Chamber filled with fumes of	Appearance of molded products	Appearance of interior metallic parts
Concentrated ammonia	Surface dull	Unchanged
10% ammonia	Unchanged	Unchanged
10% ammonia + 10% HCl	Unchanged	Unchanged
10% hydrochloric acid	Unchanged	Unchanged
Concentrated hydrochloric acid	Surface dull	Unchanged

TABLE 2

All of the apparatus was of a type broadly given the German trade-mark of ISOWAG. A dash indicates "no change".

Type	Vapors used	Final Appearance of Molded Product	Interior Metal
Rotary switch	Con. acetic acid, 80%	.....	.....
Rotary switch	30% acetic acid	.....	.....
Plug	Nitric acid, sp. gr. 1.285	.....	Affected
Rosette	Nitric acid sp. gr. 1.10	.....	.....
Rosette	Nitric oxide	Surface a little dull	.....
Rotary switch	Sulfurous acid, sp. gr. 1.024	.....	.....
Rosette	40% formaldehyde	.....	.....
Rosette	Chlorine gas	Material unchanged but lightened in color	.....
Plug	Benzine	.....	.....
Rosette	Acetone	.....	.....
Plug (sealed)	Trichloroethylene	.....	.....
Rotary switch	"Reichskraftstoff"	.....	.....

The results are best seen from a perusal of the subjoined tables. Table 1 shows the behavior of the molded insulation made from hot-pressed synthetic resins of the Kontakt Akt. Ges. type in the acid-chambers previously described, in which the articles had been subjected to ammonia and to hydrochloric acid for 15 months; while table 2 shows the effect of various substances on the designated apparatus mentioned in the tables, the time of action being four weeks. It should be remembered when studying these tables that access of the fumes to the inside of the molded through the molded insulation itself. It will be noted that in every case the metal was fully protected by the molded parts, which resisted the fumes surprisingly well.

Table 3 shows the changes in weight of the normal test rods made from the following three materials (all from the H. Roemmler A. G.), namely:

Hares C Special Type S

Hares C. Special F Type 1

Linen fabric shred molding mass Type O.

None of the material was seriously affected by the fumes. Only in two cases was even a deadening of the surface luster to be noticed, and that in the

case of nitrogen oxides and of chlorine gas.

The nitrogen oxide and chlorine fumes were very concentrated, and were accentuated as to their action by the presence of moisture. In practice such severe conditions will probably never be encountered, because the concentration of the gases was so high that even men equipped with efficient gas masks could not enter rooms containing so high a concentration of the gases.

Table 3 shows further that even concentrated acetic acid left the test roll of Hares C Special type S perfectly unchanged, while the other two materials merely lost their surface luster to a slight extent. The changes in weight in the test pieces in all instances was well below 1%, so that for practical purposes such changes may be entirely ignored. In but a single instance were the metal parts within a shell of molded insulation at all affected. This was moreover due to the corrosion of a metallic spring that closes the apparatus, so that the fumes got into the inside of the apparatus (in case of concentrated nitric acid).

The large number of tests made, and the diversity of types of insulating (molded) apparatus subjected to the severest conditions shows unequivocally that properly made molded materials will resist all commercially encountered fumes and gases so that such parts are particularly applicable to industries such as chemical works, dyeing plants, bleaching plants, stables (ammonia tests), garages, breweries and distilleries and gasoline and organic solvent plants.

Thus the manifold advantages of the modern molded products as contrasted with the older metallic parts are splendidly demonstrated.

Our readers will be aware that American products of equal quality are available, and that hence everything that was proved by these German tests will be equally applicable to American products.

TABLE 3

Chemical used	Material used	Effect on Appearance	Changes in weight
80% acetic acid	Hares C Special type S	unchanged	+0.84%
	Hares C Special F Type 1	surface a little dull	+0.26%
	Linen fabric shred mass type 0	surface somewhat dull	—0.68%
Nitric oxide	Hares C Special type S	surface somewhat dull	+0.78%
	Hares C Special type 1	surface somewhat dull	+0.88%
	Linen fabric mass shred type 0	surface somewhat dull	—0.58%
40% formaldehyde	Hares C Special type S	no change	+0.66%
	Hares C Special type 1	no change	+0.20%
	Linen fabric mass shred type 0	no change	+0.62%
Chlorine gas	Hares C Special type S	no change	no change
	Hares C Special type 1	no change	no change
	Linen fabric mass shred type 0	no change	no change
Benzine	Hares C Special type S	no change	+0.12%
	Hares C Special type 1	no change	+0.20%
	Linen fabric mass shred type 0	no change	—0.44%

New Cellulose Acetate Plasticizer Announced

Thermoplastic Products Readily Made

THE inherent brittleness of the usual cellulose acetate plastics is claimed to have been overcome by a Newark (N. J.) inventor, Mr. William Gump. According to his process, he states that 4-oxy-1-tertiary butyl-benzene and the like will overcome the tendency of cellulose acetate sheets to crack.

In his recent patent, U. S. P. 1,740,854, he describes the product as follows:—

"The various cellulose-acetate compositions to which the present invention relates are employed in the arts, generally as imitations of natural substances, sometimes in their original finished form with or without incorporated colors or other inert substances and sometimes in films which are used for photographic and other purposes.

It is well known that molded objects, sheets or films, varnishes and filaments, made from a cellulose acetate solution show brittleness after evaporation of the used solvent. Therefore, other chemical substances of a low volatility, i. e., plasticizers, must be added to the mixture of cellulose acetate and solvent to render the final product tough and flexible and, for certain purposes, substantially noninflammable. All these plasticizers are comparatively expensive.

In the course of my experiments, I have discovered that substances in the class containing 4-oxy-1-tertiary butyl-benzene and its nucelus-halogenated derivatives, in conjunction with a proper solvent, such as acetone or mixtures of halogenated aliphatic hydrocarbons with aliphatic alcohols, will convert that variety of cellulose which is soluble in acetone into a plastic mass or compound capable of being worked into molded objects, sheets or films, varnishes and filaments by those skiled in the art. These products have great flexibility and do not become brittle nor deteriorate upon aging or by heating to as high as 140° C. A cellulose acetate composition con-

(*Continued on page 404*)

Constitution of the Modern Molded Products

How the Colloid Chemist Conceives the Internal Structure of Resinoids, and the Practical Application of the Concept

By Dr. Kurt Ripper

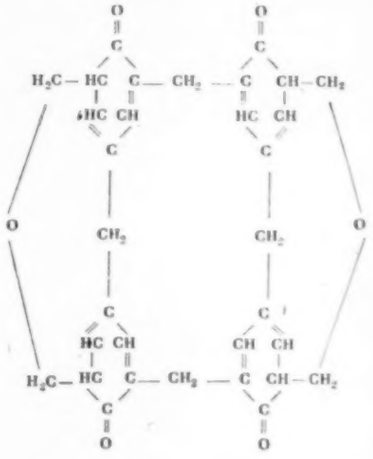
In the June issue of PLASTICS, *page 345, the first portion of the present treatise on the constitution of the modern molded products was interrupted. The first part of the article dealt with the binders, and with the chemical nature of the synthetic resins of the phenol-formaldehyde type, taking up the various successive stages in the building up of the large molecule of the final condensation products. The formula assigned by Raschig to the intermediate alkali-soluble product concluded the article. By a misprint, the notice that the article was to be continued was unfortunately omitted. The article is taken, with permission, from the private publication Kontakt-Roemmler Akt.-Ges of Germany, called "Kontakt-Roemmler Nachrichten, Vol. 1, p. 4.*

The combination of several molecules to form a larger molecule, as shown in the formula on page 345 of the June issue, can be changed by further increase in the temperature, or by the influence of chemical reagents. The change in constitution also brings about a corresponding change in properties, for the material now forms a gelatinous mass which is no longer soluble in organic solvents, but merely swells therein with considerable increase in volume. This change in constitution is strongly exothermic, and if the operation is not carefully watched, the heat liberated can be so excessive that explosions may take place. This exothermic nature of the reaction is a further proof that the new substance formed contains less free energy than the substance from which it is derived, which also points to the fact that the new substance is more stable. It is quite essential, in the production of these artificial substances, to aim to secure a product that contains the least possible amount of free energy, for otherwise the product will not be thoroughly stable, and will be subject to later undersirable changes in condition and properties.

Building Up the Molecule

From a colloid-chemical standpoint, the condition of the new product is characterized as that of a true gel, and according to the definition of Freundlich, it is an elastic gel. This gel does not melt on heating, but under the combined action of heat and pressure it temporarily becomes plastics, finally, under the continued influence of heat and pressure, becoming fully infusible and inert to all organic solvents. The same transformation into the final insoluble and infusible state can, moreover, also be brought about by continued slow heating without the use of pressure. While the first soluble stage is quite sharply differentiated from the second gelatinous change, the transition from the second to the third change is not so sharp, but is a gradual one. The author has made a thorough investigation of the colloid-chemical nature of this transition, and will discuss the same in subsequent articles.

As the final product, in any case, is insoluble in alkalies, it can safely be assumed that there then are no longer any hydroxyl groups present, a state that is usually described as one of anhydration. Herzog and Kreidl, on the basis of a theory of resinophor groups propose (8) the following formula for the final insoluble and infusible product, which no longer contains any hydroxyl groups.



Another view, more truly colloid-chemical, is that expressed by Barthelemy (9) in the following formula

$$[(\overset{n}{\underset{1}{\Sigma}} C_6H_4\,O,\,CH_2)\,H]\,OK$$

It is fairly certain that the "n" in the final product is greater than "4", as would be indicated by the Herzog and Kreidl formula, as the properties are too greatly different to be accounted for merely on the basis of dehydration.

The technical application of these theories of the constitution of the phenolic and allied resins, forms the basis of the modern methods of hot-molding. However, more than a mere consideration of the chemical changes is involved in building up a good pressing technique. C. H. Bryson (12) says quite properly "The molding of arti-

ficial resin plastics forms a whole industry in itself and requires great technical skill and experience. Any one who desires to devote himself to this industry must, at the same time, be a chemist, an engineer, a draftsman, and an inventor."

Molding Technique

Baekeland has effected the transformation from the second to the third stage by the use of increased temperature, combatting the formation of bubbles of gas by pressure. Baekeland himself worked with relative low pressure. The modern rapid-molding technique aims at two things: the finished article should leave the mold in the shortest possible time because the molds are expensive, while at the same time the finished article should be of the highest quality; at any event it must all have had its resin content converted into the infusible-insoluble variety. Chemically speaking, the dehydration and polymerization of the resin MUST be complete when the piece emerges from the mold. By proper chemical and physical control it is possible, and good molding technique requires it to be, that the preliminary stages, that is the change from the first soluble to the second intermediate stages, take pacle *before* the actual molding, so that the molding operation merely serves to give the proper shape to the article and to convert the intermediate stage to the final end-product.

Pressure and Temperature

There is, moreover, a definite relationship between the molding pressure and the molding temperature. The nearer the molding powder resin content is to the final infusible stage, the higher becomes its melting or softening point, and hence the molding pressure must consequently be greater. However the unavoidable wear and tear on the molds places an upper limit on the commercially applicable molding-pressures. It is therefore essential, from an economic standpoint, to employ a molding mixture that possesses good flow. This is accomplished by the addition of various material, but especially such as will bring about a transformation of the resin into the final infusible stage within the shortest possible period of time. At the same time, in order to increase the flow as well as the speed of the chemical reaction during the molding, the temperature should be chosen rather high, as it is known that the reactivity about doubles for every ten degrees rise in temperature. The higher the finishing temperature in molding, the greater is the assurance that the product contains only the desired infusible and insoluble form of the resin.

From the foregoing it will be evident that the chemical reactions involved not only apply to the manufacture of the molding compound, but also play an important part in the molding operation itself. Therefore the directions given to molder by the manufacturer of the molding powder or mass must be carefully adhered to if the best possible results are to be expected. The reactivity of a product is usually inversely proportional to the degree of polymerization, i.e. the higher its molecular weight the lower is reactivity. This is true not only of the synthetic resins, but of organic colloids in general. For example, the simplest building stone from which albumen can be built up, glycocoll, amino-acetic acid, are still quite reactive; but as the building up of the poly-peptides continues the reactivity becomes lower, the albumens themselves being comparatively unreactive. In the last analysis, the colloids then only act as a unitary group. Obviously the character of the colloid is determined by the individual molecular building-stones from which it has been built up.

Effect of Reagents

The raw material from which most of the synthetic resins are derived, phenol, is a weak acid. It is interesting to note that this acidic character maintains itself despite all of the condensation and palymerization, so that even the final hard product has an acid nature. One practical demonstration of this lies in the fact that the final condensation products are almost entirely unattacked by acids.

At the same time it will be noticed that cold alkalies also do not affect the products; this being caused by the above-mentioned anhydrization during the polymerization to the final insoluble-infusible stage. Strong hot alkalies, however, do affect the phenol resinoids. What occurs is probably a breaking down of the anhydride oxygen linkages. This is characteristic of an acidic substance of the nature of these resins. As the amount of alkali diminishes, so does the degree to which the alkali acts upon the hard resinoids. Water, organic solvents and the like, however, are without effect on properly cured resinoid molded products, even though applied at the boiling temperature. It is therefore possible to use these molded products under conditions in which they are subject to damp air, and acid or ammoniacal fumes. They do not lose their insulating properties under such circumstances.

The Fillers

What has been said so far, relates particularly to the binders, i.e. the resins and resinoids that hold the material together. However, as already indicated, the fillers also exert a considerable influence on the properties of the final products. Therefore a complete discussion as to the resistance, strength and properties of molded objects can not be undertaken until all of these additional substances have been described and their influence ascertained.

In the forthcoming continuation of this article the properties and influence of the various fillers, such as asbestos, cellulose, woodflour etc. will be taken up.

LITERATURE REFERENCES

The following footnotes refer to the numbers in parenthesis that were

(*Continued on page 402*)

The World's Recent Progress in Synthetic Resins

A complete and condensed account of patents from the most important industrial countries

By Dr. Aladin

The patents that are listed here are all of recent origin and disclose the progress realized throughout the civilized world in this field. The dates, except in case of U. S. patents, are those of application. There will be a total of over 450 patents in this review. Publication began in April, 1929.

Urea-formaldehyde Resins

(Continued from May Issue)

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
341	French P. 623,983 Nov. 2, 1926	British Cyanides Co. Ltd. E. C. Rossiter)	Preparation of artificial resins from urea or thiourea and formaldehyde.	See Brit P. 266,028 (No. 311).
342	French P. 624,441 Nov. 10, 1926	Kunstharzfabrik Dr. F. Pollak, G.m.b. H.	Preparation of porous artificial masses.	Primary condensation products of urea and aldehydes, which have been prepared according to French P. 581,488 (Cf. Canadian P. 254,674, No. 288) and whcih have been further treated according to French Patent 611.973 (Cf. Austrian P. 103,910, No. 355); or else hydrophobe resins made according to the last-mentioned patent, are diluted, with addition of a small amount of an acid, to a concentration corresponding to 30% of urea. The mixture is allowed to stand for some time at 15° C., and is then heated to 40° C. until the formation of a gel is completed, which requires about two or three days. The resulting resin is then separated from the mother-liquor, and is hardened in the usual manner. It forms snow-white masses similar to meerschaum.
343	French P. 625,145 Nov. 26, 1926	G. Walter	Preparation of plastic masses.	Mono, or di-methylolurea or the corresponding thiourea compounds or mixtures thereof, are rapidly heated above their melting point, and then further heated with the addition of suitable stabilizing agents. Substances that lower the melting point of the composition may be added. Aldehydes such as formaldehyde or its polymers may also be added. The products are worked up either into lacquers, or, by hardening under pressure, into glass-clear solid masses.
344	French P. 632,526 April 9, 1927	Silur Technische chemische Produkte Gess. m. b. H.	Preparation of plastic masses from urea or thiourea-formaldehyde condensation products.	To the mixture of raw materials, prior to their condensation, fillers such as flour, starch or similar substances are added. Natural or artificial resins, softeners such as lanolin and camphor may also be added.
345	French P. 636,219	F. Schmidt	Preparation of aminoplastics.	See Brit. P. 281,993 (No. 317).
346	French P. 637,051 Oct. 29, 1926	H. Spindler	Prepartion of an artificial resin	

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
347	French P. 637,318 May 14, 1927	Kuntsharzfabrik Dr. F. Pollak, G.m.b. H.	Preparation of artificial masses from urea and its derivatives and formaldehyde.	The primary water soluble condensation products derived from urea and formaldehyde, or from urea-derivatives, are diluted with water until the solution contains about 15% of urea. Thereupon acids, salts, or compounds, ammonium salts, hydrogen dioxide, or, simultaneously with thiourea or phenol basic substances are added. Further additions may comprise tanning agents, natural or artificial, or phosphomolybdic acid. The mixture is heated until a resin is formed as a flocculent precipitate. The resin forms, when pressed, glass-clear masses, but may be used with the ordinary fillers.
348	French P. 641,420 Sept. 11, 1926	I. G. Farbenindustrie	Condensation products of urea and formaldehyde, or from dimethylol urea.	The usual raw materials, in solution, are condensed in the presence of natural or artificial resins, cellulose esters or plasticizing and softening agents.
349	Dutch P. 14,285	W. Goldschmidt and O. Neuss	Preparation of artificial masses.	Formaldehyde is condensed with urea or its derivatives, such for example as carbaminic acid derivatives, substituted ureas, thioureas or substances that yield such urea compounds. The condensation is carried out in the presence of water and of small amounts of slightly acidic substances such as phenol, casein, and the like, which themselves are also capable of reacting with or combining with the formaldehyde with the formation of resins.
350	Dutch P. 15,567 Aug. 17, 1923	W. Goldschmidt and O. Neuss	Preparation of plastic masses from urea and formaldehyde.	The solid condensation products produced from urea and formaldehyde in the presence of acids, acid salts or of acid-reacting substances such as resorcinol are either hot-pressed in molds or hardened by heat.
351	Austrian P. 98,545 Sept. 3, 1920	F. Pollak	Preparation of hard in-insoluble condensation products.	See U. S. P. 1,458,543 (No. 273).
352	Austrian P. 99,415 March 31, 1923	K. Ripper (to F. Pollak)	Condensation products of urea or its derivatives with formaldehyde.	See German P. 456,082 (No. 293).
353	Austrian P. 99,906	F. Pollak	Preparation of insoluble and infusible condensation products of urea, thiourea and its derivatives and formaldehyde.	See German P. 437,533 (No. 288).
354	Austrian P. 101,293	F. Pollak	Insoluble condensation products from urea or its derivatives and formaldehyde.	See British P. 206,512 (No. 295).
355	Austrian P. 103,910 March 3, 1925	F. Pollak	Preparation of hydrophobe resins by condensation of urea or its derivatives with aldehydes, especially formaldehyde.	The liquid primary condensation products resulting from the warming of a solution of urea and formaldehyde etc. are treated with thiourea or phenol, or with other similar compounds capable of uniting with and condensing with formaldehyde until resins separate from the fluid mixture on cooling.
356	Austrian P. 105,809	Gesellschaft für Chemische Industrie	Preparation of condensation products from urea or its derivatives and formaldehyde.	See U. S. P. 1,674,199 (No. 282).
357	Austrian P. 107,155	K. Ripper	Condensation products from urea or its derivatives.	See U. S. P. 1,625,283 (No. 274).

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
358	Austrian P. 107,427 Oct. 1, 1924	K. Ripper (to F. Pollak)	Process of treating condensation products derived from urea or its derivatives, and aldehydes.	The process relates to the working up of waste products resulting from the manufacture of such condensation products, or waste from milling or machining the same, as well as to fluid intermediate products. The viscous fluid intermediate products are dissolved in suitable solvents and are thus employed as lacquers or impregnating media. Solid final condensation product wastes are liquefied by heating with acids, being dissolved, but separating from the hot solutions on cooling. The resulting substances when treated with formaldehyde yields sols which may serve as lacquers etc.
359	Austrian P. 107,429 Aug. 25, 1924	K. Ripper (to F. Pollak)	Preparation of fluid, semi-solid and solid condensation products of urea, its derivatives and substances yielding the same, and aldehydes.	In order to prevent checking, crazing and cracking of the solid final condensation products of the amino-plastic type, the same are treated, while still in the condition of an organic sol, with cellulose and its derivatives, as well as with borneol, camphor, benzyl alcohol and other substances of the same general nature. The products, depending upon their consistency find application as lacquers, as substitutes for optical glass, for making artificial silk, artificial horse-hair, films and the like.
360	Swiss P. 103,655 July 17, 1922	F. Pollak	Preparation of amino plastics.	See U. S. P. 1,458,543 (No. 273).
361	Swiss P. 105,657	F. Pollak	Preparation of amino plastics.	See U. S. P. 1,625,283 (No. 274).
362	Swiss P. 108,465	F. Pollak	Insoluble amino plastics.	See British P. 206,572 (No. 295).
363	Swiss P. 111,790 March 17, 1924	F. Pollak	Preparation of amino plastics.	See German P. 456,082 (No. 293).
364	Swiss P. 117,170 March 10, 1925	Ges. f. Chemische Industrie	Preparation of condensation products of urea or its derivatives, and formaldehyde.	To the water-soluble primary condensation product resulting from the reaction between 1 mol of urea and at least 2 mols of formaldehyde there are added either before, during or after the main reaction further quantities of urea, and the resultant mixture is then worked up in the presence of an acid catalyst into the hard final condensation product.
365	Swiss P. 117,361	F. Pollak	Preparation of amino plastics.	See Canadian P. 254,674 (No. 286).
366	Swiss P. 118,725 June 5, 1925	Ges. f. Chemische Industrie	Preparation of urea-formaldehyde condensation products.	Activated carbon is employed as the condensing agents, either during only the formation of the initial condensation product or during the subsequent steps of the condensation.
367	Swiss P. 120,811	Ges. f. Chemische Industrie	Preparation of urea-formaldehyde condensation products.	See British P. 260,288 (No. 307).
368	Swiss P. 122,601	F. Pollak	Preparation of hydrophobe resins from urea, its derivatives and aldehydes.	See Austrian P. 103,910 (No. 355).
369	Swiss P. 122,939	Ges. f. Chemische Industrie	Condensation products of urea and its derivatives with acrolein.	See British P. 260,288 (No. 307).
370	Swiss P. 123,689	Ges. f. Chemische Industrie	Condensation products of urea and its derivatives with acrolein.	See also British P. 260,288 (No. 369 and 307).
371	Swiss P. 124,141	British Cyanides Co. Ltd.	Preparation of artificial resins from urea and formaldehyde.	See British P. 266,028 (No. 311).

(*Continued on page 393*)

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
372	Swiss P. 125,010 Sept. 10, 1926	I. G. Farbenindustrie A.-G.	Preparation of condensation products from urea and formaldehyde.	The components of the resin are condensed in a medium that is kept permanently slightly acid, the reaction being carried out at temperatures below 50° C. From 2 to 3 mols of formaldehyde are used from each mol of urea.
373	Swiss P. 126,827	Ges. f. Chemische Industrie	Preparation of condensation products from urea and formaldehyde.	See British P. 281,717 (No. 316).

2. Hardening the Aminoplastics

374	Brit. P. 259,950 Oct. 6, 1926	I. G. Farbenindustrie	Hardening of urea-formaldehyde condensation products.	The hardening of these products takes place by means of sulfurous acid, which may be dissolved in an organic solvent such as acetone.
375	Brit. P. 264,466 Dec. 10, 1926	I. G. Farbenindustrie	Hardening of urea-formaldehyde condensation products.	Instead of using sulfur dioxide (sulfurous acid) as described in the main patent (No. 374), other gaseous acids such as hydrochloric or hydrofluoric acid, or solution of the same, or other acid anhydrides may be employed.
376	Austrian P. 109,532 March 3, 1925	K. Ripper (to F. Pollak)	Method of making formed objects from urea-formaldehyde condensation products.	Urea-aldehyde condensation products are very carefully heated so that products result that while solid at room temperatures will nevertheless swell and become soft in such solvents as water, benzene, acetone etc., in which softened condition they may be molded and then hardened by heat and pressure.
377	Swiss P. 125,011 Oct. 13, 1926	I. G. Farbenindustrie A.-G.	Hardening urea-formaldehyde condensation products.	See British P. 264,466 (No. 375).

3. Application of Aminoplastics

378	Brit. P. 258,950 July 1, 1925	British Cyanides Co., Ltd. and E. C. Rossiter	Preparation of articles from artificial resins.	The primary condensation products of thiourea with formaldehyde are mixed with fillers and acid condensing agents such as oxalic acid, tartaric acid, sodium bisulfate, aniline hydrochloride etc. The products are finally hardened under pressure.
379	Brit. P. 262,818 Dec. 13, 1926	I. G. Farbenindustrie A.-G.	Plastic masses, lacquers and the like.	Solutions of urea-formaldehyde condensation products in organic solvents such as methanol, dichlorohydrin, formamide, glycol ethers, or lactic acid esters, receive an addition of substances which are capable of forming solid solutions with the condensation product, such as collodion. If lacquers are desired, the amount of solvents is correspondingly increased.
380	Brit. P. 278,801 July 13, 1926	British Bead Printers Ltd. and F. A. H. Heynert	Ornamenting articles.	Articles are coated with urea-formaldehyde condensation products, and the resulting coatings are hardened by heat.
381	Brit. P. 282,786	K. Stoll	Preparation of glass-like coatings on stones, etc.	The stones are coated with solutions of urea-formaldehyde resins, either alone or in admixture with phenol-formaldehyde resins, to which suitable plasticizing agents have been added.
382	Brit. P. 285,554 Nov. 16, 1926	British Dyestuffs Corp. Ltd. (R. S. Horsfall and G. Lawrie)	Protecting animal fiber against alkalies.	The solutions used for treating the animal fiber, (such as wool), receive an addition of the soluble condensation products of urea with aldehydes; for example such substances as dimethylolurea.

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
383	Brit. P. 294,551 July 25, 1928	I. G. Farbenindustrie	Method of altering the physical properties of formed articles made from degenerated cellulose (addition to Brit. P. 278,684 (No. 489).	Artificial filaments consisting of regenerated cellulose are treated with slightly acid solutions of the resinous condensation products derived, for example, from dimethylolurea, or monomethylolurea; the treatment being carried out in the presence of sodium phosphates. The resulting coatings on the filaments are rendered insoluble by drying at 110 to 120° C.
384	French P. 593,442 Feb. 16, 1925	J. C. Vredenburg	Ornamenting fabrics and leather, etc.	Fluid or semi-solid primary condensation products from urea and formaldehyde are applied by printing or transfered to the fabrics, being hardened thereon by heating.
385	French P. 631,645 Nov. 16, 1926	Réalisation des Brevets Francais Amoureux & Co. (F. C. Wickel)	Preparation of a transparent fat—and moisture-proof wrapping material.	Strongly calandered sulfite-cellulose paper is given a coating on both sides with a fluid formaldehyde-urea condensation product, the coating being then hardened by calandering at 120 to 150° C.
386	Austrian P. 106,210	R. Goldscheider	Imitations of frosted glass and stained glass.	A fabric is coated with a lacquer consisting of formaldehyde urea condensation products, is then sprinkled on both sides with glass powder, and again lacquered.
387	Swiss P. 124,635 Aug. 10, 1926	Ges. f. Chemische Industrie	Preserving and deodorizing medium.	Aqueous solutions of condensation products of urea or of its derivatives with formaldehyde, containing not over 2 mols of formaldehyde are used as preserving media. They may also be mixed with other active preservatives.
388	Swiss P. 125,725 Dec. 8, 1926	I. G. Farbenindustrie A.-G.	Lacquer.	Collodion solutions containing urea-formaldehyde condensation products in admixture with hexyl acetate and benzene are used as lacquers.
389	Swiss P. 127,274 March 1, 1927	Ges. f. Chemische Industrie	Preparation of assembled articles from artificial resins.	Preformed molded pieces from urea-formaldehyde resins are united homogeneously, preferably by means of pressure, or by suitable adhesives.

Beginning with No. 390, in our next portion of this review, the preparation of resins from phenol without formaldehyde will be taken up.

Technical Abstract Section

A Concise Review of Patents and Literature

Phenol-Carbohydrate Resin and Method of Making Same. James McIntosh, assignor to Continental-Diamond Fibre Company, Newark, Del. U. S. P. 1,753,030; April 1, 1930.

A synthetic resin consisting of a hard, dense, lustrous, infusible, insoluble resinous solid constituting the final product of the reaction of a phenol and starch.

Method of Manufacturing Spectacle Frames from Tortoise-Shell and Similar Valuable Material. Ernst Kähne, assignor to the Firm Theodor Kähne & Söhne, Rathenow, German. U. S. P. 1,752,953; April 1, 1930.

The method of manufacturing spectacle frames, which consists in cutting an elongated blank from a plate comprising a bridge portion and the rim portions disposed in a plane, bending the rim portions into circular form and uniting the ends thereof at a point spaced from the bridge portion, and bending the bridge portion into the form of the bridge.

Process for Producing Cellulose Acetate. Arthur Russell and Joseph F. Hegeman. U. S. P. 1,752,853; April 1, 1930.

Process of producing cellulose acetate which consists in mixing cellulose with an acetylizating solution and acetylizing the cellulose under pressure of between 50 and 75 pounds per square inch, and adding a hydration mixture and raising the pressure while maintaining the temperature.

Moldable Composition. Adam Hoche, assignor to Litmo Adhesive & Products Company, Lynn, Mass. U. S. P. 1,753,010; April 1, 1930.

A composition moldable under heat and pressure comprising cupra-ammonium, a resinous body and a filler.

Dielectric Substance. Alan R. Lukens, assignor to The Richardson Company, Lockland, Ohio. U. S. P. 1,752,917; April 1, 1930.

A molded article for use in the presence of electrolytic action comprising bitumen with finely divided acid resistant mineral matter and organic fibre, said organic fibre being in proportion of 10% to 15% of the mass by weight, and uniformly dispersed in the bitumen and coated thereby to an extent comparative to colloidal mixture.

Process of Directly Producing Phonogram Carriers Suitable to Be Played Off. Alfred Chmielowski, Vienna, Austria, assignor to Sigmund Katscher, Vienna, Austria. U. S. P. 1,754,935; April 15, 1930.

A phonogram record comprising a surface layer of gelatine having a sound groove cut therein.

Method of and Means for Making Tubes of Celluloid and the Like. William Mendel, Beverly, N. J., assignor to Sanite Corp., Burlington, N. J. U. S. P. 1,755,786; April 22, 1930.

Apparatus for forming celluloid tubing, including means for winding a sheet of celluloid in a roll while immersed in a solvent bath and means for forcibly circulating the solvent in said bath during the winding operation.

Manufacture of Friction Bodies. Hans Kattwinkel, Coswig, Germany. U. S. P. 1,755,355; April 22, 1930.

A method of the character described, comprising the steps of intimately mixing loose asbestos fibres with a solution of a phenolic condensation product, drying the mixture, pressing it into solid cakes, superposing a plurality of such cakes, pressing them together into the final shape of the body to be manufactured, and hardening the compressed mass under the influence of heat.

Battery-Box-Container Composition and Method of Making Same. Rufus N. Chamberlain, Depew, N. Y., assignor to Gould Storage Battery Company, Inc., New York, N. Y. U. S. P. 1,755,500; April 22, 1930.

A storage battery box molded of a composition comprising petroleum asphalt, gilsonite, a fibrous binder and an inert filler, the said constituent materials thereof being united to form a blend including such relative proportions of said materials as to produce a hard yet tough, homogeneous, substantially non-cellular mass which is resistant both to physical shocks and to attack by storage battery acid.

Plastic Process. Willis A. Boughton, Cambridge, Mass., assignor to Bennett Box Company, Boston, Mass. U. S. P. 1,756,010; April 22, 1930.

A method of preparing stiffener blanks for use in shoes and the like, comprising the steps of impregnating a carrier sheet with melted rosin, permitting the rosin to harden to a stiff condition, and thereafter, prior to reshaping the stiffener blank in a shoe or other article, introducing said blank into a liquid mixture consisting of 30 to 35 per cent by volume of solvent and 70 to 65 per cent of non-solvent, and capable of softening the stiffener blank without substantial dissolution during immersion of the blank in the liquid mixture for hours.

Packing Material. Hugo Reinz, Berlin-Spandau, Germany. U. S. P. 1,756,881; April 29, 1930.

A packing material comprising a closely woven asbestos-metal fabric impregnated with a phenolic condensation product and a sheathing of impermeable material intimately united therewith to form an inseparable whole, said impermeable material being constituted by a mixture of asbestos, a filler and a binder therefor.

Synthetic Product and Process of Making Same. Boris N. Lougovoy, Montclair, N. J., assignor to Ellis-Foster Company, Montclair, N. J. U. S. P. 1,756,252; April 29, 1930.

A white solid comprising the reaction product of a phenolic body on dimethylol urea.

A molding composition containing the crushed and dried reaction product of a phenolic body on a methylolurea containing a filler, the opacity of the final product made therefrom being determined by the amount of filler therein.

A molding composition containing the crushed and dried reaction product of a phenolic body on an acid-containing reaction product of an aldehyde and a carbamid derivative.

Dry Molding. William B. Westcott, Boston, Mass., assignor to Rubber Latex Research Corp., Boston, Mass. U. S. P. 1,756,411; April 29, 1930.

In the manufacture of rubber articles, the process which comprises compounding a mass of fillers including fibers with preserved latex, admixing with the latex ingredients to prevent tackiness of the subsequently dried material, drying the compounded mass to form an agglomerated body, dividing the dried material into loose fibers carrying rubber derived from the latex, said fibers being non-tacky, shaping the divided fibers into the desired form and thereafter vulcanizing with the aid of heat and pressure.

As a new composition of matter for producing molded rubber articles, a mass of loose shredded asbestos fibers coated with unvulcanized non-tacky rubber from latex gelled in situ.

Extrusion Machine. Bruno Max Alfred Trebes, Oak Park, Ill., assignor to Western Electric Company, Inc., New York, N. Y., U. S. P. 1,752,471; April 1, 1930.

In an extrusion machine, an extruding head, and a gear pump for forcing plastic material therethrough comprising a casing, a pair of gears rotatably mounted therein, meshing with each other, the gears being composed of a plurality of laminations means for selectivly engaging or disengaging the laminations with or from each other, means for locking the disengaged laminations, and means for rotating the gears.

Process for the Manufacture of Horn-like Material. Julius Schlinck and Georg Münchmeyer, Hamburg, Germany. U. S. P. 1,752,626; April 8, 1930.

The process of preparing horn-like materials from casein which comprises treating the casein mixed with a hardening medium comprising the product of the treatment of paraformaldehyde with an acid selected from the group consisting of sulphuric acid and formic acid for the purpose of hardening said materials.

Stencil Sheet. Shinjiro Horii, Tokyo, Japan. U. S. P. 1,753,204; April 8, 1930.

A stencil sheet for stencilization by pressure, comprising a base of thin Japanese paper of the maximum felting and grease-proofing qualities, consisting of highly hydrated bast fibres, and coated with a coating material impermeable to ink.

Varnish or Lacquer and Method of Preparing the Same. Harold F. Wakefield, Newark, N. J., assignor to Bakelite Corp., New York, N. Y. U. S. P. 1,756,267; April 29, 1930.

Method of preparing non-penetrative varnishes and lacquers from reactive resins of the pheno-aldehyde type, comprising effecting a partial transformation of the reactive resin to the insoluble resinoid modification by application of heat, commingling it with a solvent for the reactive component, and mechanically converting the mixture into a colloidal dispersion.

Method and Apparatus for Forming Plastic Explosives Into Strings. Anton Erik Andelin, Bromarf, Bjorknas, Finland, assignor to Finska Forcit-Dynamit Aktiebolaget, Hango, Finland. U. S. P. 1,756,328; April 29, 1930.

Apparatus for preparing plastic explosive material in string form for use in the manufacture of dynamite cartridges and the like, which comprises a pair of pressing rollers adapted to press a quantity of plastic material into sheet form, a pair of cooperating grooved rollers, means for feeding said material from said pressing rollers to said grooved rollers, said last named rollers being adapted to form the material into a plurality of continuous strings separated from one another, and means for conveying said formed strings away from said grooved rollers, said apparatus including a drive shaft, and clutch members for releasably connecting said drive shaft to the pressing rollers and the grooved rollers.

Laminated Cork Sheet and the Method or Art of Making Same. Charles E. McManus, New York, N. Y., assignor to Crown Cork & Seal Company, Inc., New York, N. Y. U. S. P. 1,756,950; May 6, 1930.

The herein described method or art of making laminated cork sheets consisting in progressively subjecting succeeding portions of a lamina comprising composition cork sheet, and a surface lamina of natural cork, to the simultaneous application of heat and pressure, whereby said laminæ will have their contiguous surfaces brought into accurate conformity, and firmly bonded together and finally relieving the pressure thereon while subjecting the sheet to a normal temperature.

Further Abstracts will be found on p. 405

Changing Trends in the Resinoid Field

Research being concentrated on the amino-plastics and light-colored products

By Carl Marx
Editor, PLASTICS

AS our observant readers may already have noticed, there appears lately to be a very decided falling off of the number of United States patents issued on the subject of the manufacture of synthetic resins. There is a real good explanation for this.

The expiration, late in 1926, of the broadest and most basic patents on these resins, (Baekeland patents), set innumerable investigators to experimenting with these products in the hope of attaining some new result upon which they might found a business. Many concerns that had hitherto bought their phenolic resins and their molding powders became imbued with the idea that it would be a comparatively simple matter to embark on the manufacture of these products, now that there no longer was any barrier to their so doing.

The Resin Rush

The result was a veritable landslide of patent applications covering all kinds and manners of phenolic resins and products, some differing from each other so slightly that only an expert could tell them apart. Besides the independent inventors, there were of course the usual number of applications filed by the regular research workers of the large companies that already were in the field.

The usual time required to get a patent application through the Patent Office is about 3½ years, hence the year 1929 saw the issuance of the greater number of these applications. In some weeks there would be as many as fifteen or more patents issued in this field. The number at present has fallen to about one or two per week, and in some weeks there have been none at all.

A further factor in this situation is the commercialization of the urea-formaldehyde resins, or aminoplastics. These, being light in color, and in some instances clear as glass, have interested the trade tremendously, and the workers are now directing their efforts in the direction of the production of light-colored and light-stable (i.e. non-after-darkening) resinoids. No doubt many applications in the field of these aminoplastics are being filed, with a resulting crop of patents in this field about two years hence.

Place for the Old

Just what effect the perfection of a really good thermoplastic colorless compound is going to have on the older and better established phenolic resins is very hard to predict. In many cases of molded products, especially in the electrical insulation field, color plays no role, and electrical resistivity, strength and low cost are the determinative factors. We venture to predict that for many years to come the simple strong low-priced but high-quality phenolic resin molding powders will maintain their supremacy in the electrical insulation trade; for example in such products as telephone switch-board equipment, oil-burner control mechanism, airplane apparatus and dash-boards, automotive, airplane and motorboat ignition systems, etc.

In the field of household utilities, color will probably play a considerable role, and we see a literally "bright and rosy" future for the highly colored, mottled and even transparent molded products that appeal mainly to the eye. Examples of this large and growing group are handles for cooking utensils, percolator handles, and the line of molded table-ware such as has been introduced and sponsored by Beetle. The fact that in England a whole large store can be supported merely by these molded light-colored products (the *Beatl Shop*, on Regent Street, London) is an interesting sidelight on these products.

Newer Uses

Thus far, at least one large American department store has put in these products and is featuring them in its department devoted to table-ware and crockery. The possibilities of these materials in the purely artistic field, such as for vases, small statuary and for table ornaments remain to be developed, but will without doubt play an important factor in the future.

On the other hand, activity in the production of cellulose esters and ethers of the relatively non-flammable type is high; especially as related to thermoplastic cellulose acetate compositions. While at present there are but very few commercial cellulose acetate plastics on the American market, their number will undoubtedly increase within the next few years. As to whether this can be done without a patent fight, remains to be seen; as many of the most important patents in this field are in the hands of just two or three concerns.

The casein plastics appear to

(*Continued on page 403*)

Sound Waves and The Resinoids

How inventors have exercised their skill in adapting the synthetic resins to record production.

By Charles W. Rivise

CONTINUING this difficultly compiled resume of the art of making sound records, as culled from the huge mass of patent art that has accumulated in this field (see June PLASTICS, p. 344), we herewith reproduce a further number of the United States patents granted in this field.

38. E. E. Novotny & D. S. Kendall, 1,470,637, Oct. 16, 1923. Filed Jan. 17, 1922.

Discusses prior art and states that phenol and acetylene have been condensed in the presence of mercuric sulphate as a contact agent and sulphuric acid as a catalyst, and that this product has been hardened with paraldehyde in presence of an acid. Phenol-freed phenol acetylene resin containing some mineral acid such sulphuric is heated in auto-clave by admission of steam and paraldehyde added with agitation, steam being turned off and cold water added. Ammonia, alkali or alkali carbonate is then added to neutralize the free acid and the product is purified by means of steam distillation. Product is dry, friable, grindable shellac material, permanently fusible and soluble in alcohol or acetone and may be molded into sound records. Product may also be ground and mixed with various fillers such as rotten stone, cotton flock, wood flour, cellulose or lampblack to be formed into powder or rolled into sheets for making records. Stearic acid may be added as lubricant to prevent adhesion and give better flowing quality.

39. C. Ellis, 1,482,358, Jan. 29, 1924. Filed Sept. 29, 1922.

This patent suggests making a sound record by casting or impressing a methylol urea compound upon a phonograph record mold. A variation consists in employing a suitable backing of cardboard or other composition to reduce the cost. The methylol urea compound is preferably made as follows:—Urea and paraform are mixed in the presence of caustic soda or barium hydroxide and as soon as the mixture becomes turbid a mild acid such as acetic is added to check the reaction. The setting of the solution can be brought about by the addition of strong acid such as hydrochloric, sulphuric, phosphoric, or oxalic, or an acid salt such as bisulphate or certain organic acids. Fillers may be incorporated into the composition such as wood flour, asbestos, cotton flock, silk flock, whiting, barytes, gypsum, zinc oxide, lithopone, China Clay, Plaster of Paris, Portland and other hydraulic cements.

40. T. A. Edison, 1,492,023, April 29, 1924. Filed Feb. 11, 1922.

The base of the record consists of a molded mixture of wood flour or powdered chalk and small amount of suitable binder such as shellac or resin and coated with phenolic condensation product, the grooves of the record being impressed in said coating. The invention is directed to coating such a record with a film of stearin dissolved in alcohol in order to eliminate the necessity of highly polishing of the diamond styli employed for reproduction.

41. T. A. Edison, 1,546,573, July 21, 1925. Filed May 25, 1923.

Two record blanks of the Edison type are coated on adjacent faces with wax or Condensite and superimposed with two sheets of tissue paper therebetween; disposed in a record mold between the opposed matrices thereof; subjected to heat and pressure and separated. Tissue paper may be left on to form finishing surface. Product is a single-faced record. Paper being yielding allows better flow of the record material in mold.

42. A. Amann, 1,614,172, Jan. 11, 1927. Filed Dec. 13, 1923.

First any one of the following products is made:—

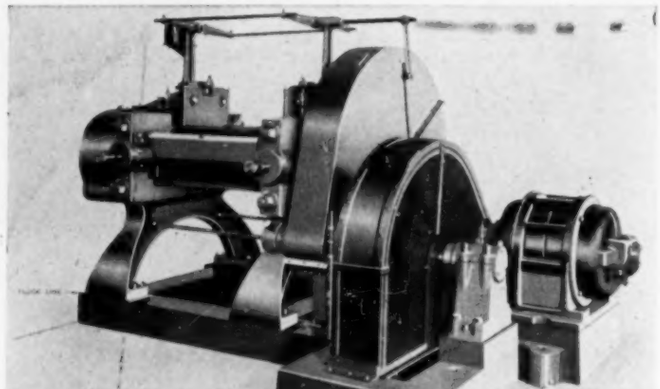
1.—Phenol and acetone are allowed to stand in the heat while concentrated hydrochloric acid is added. Product is dihydroxy-diphenyl-dimethane.

2.—Phenol, methyl-ethyl ketone and hydrochloric acid allowed to stand in the heat and ether added. Product is recrystallized from benzene of ligroine and is dihydroxy-diphenyl-methyl-ethyl methane.

3.—Phenol and dibenzyl ketone are melted together and allowed to stand at room temperature with concentrated sulphur acid. Product is dihydroxy-diphenyl-dibenzyl methane.
hyde and water and acidulated, concentrated Hydro-chloric acid are allowed to stand at room temperature.

Any one of the above products dissolved in caustic acid, mixed with formaldehyde and precipitated with acid such as hydrochloric yields a resin.

Product of first example may be heated under slight pressure with caustic soda, paracetaldemagnesian marlstone, calcareous or shaken with caustic soda, ben-



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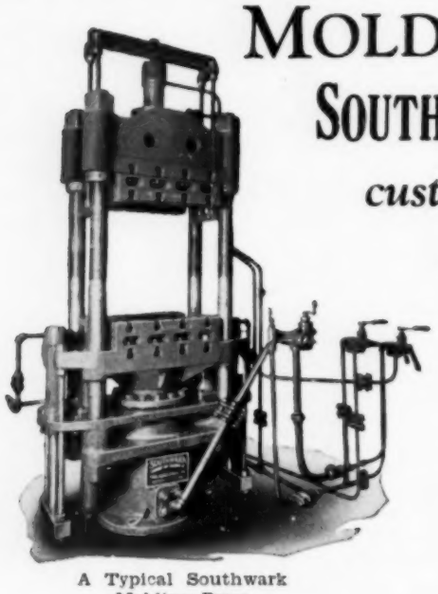

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zaldehyde and water and acidulated to give resins. Properties of resins depend upon acid used. Fillers such as chalk, barytes, magnesian marlstone, calareous spar, clay, metal oxides, metal colors, infursorial earth, asbestos, cellulose, wood peat, wood flour, paper flour, wool, wool waste and textile materials or mixtures thereof may be incorporated. The product is suitable for molding record tablets.

43. J. McIntosh & E. Y. Wolford, 1,642,078, Sept. 13, 1927. Filed August 12, 1920.

Phenol, cresol (either o-, p- or m-cresol) or any compound containing a hydroxy radical joined to a benzene ring substitulted or not is mixed with glycerine or one of its derivatives such as epichlorhydrin, allyl alcohol, glycerine aldehyde or dihydroxy-acetone and a catalytic agent such as sulphuric or hydrochloric acid, bromine, pyridine, sulphur monochloride, aniline hydrochloride, ammonia or sodium bisulphate, and boiled under a reflux condenser and then further heated in an oven to either initial or to insoluble and fusible stage. A hardening agent such as hexamethylenetetramine, benzidine-acetone or sodium-acetone-bisulphate and pressure accelerates the change to the final stage. The catalysts can be removed by washing the initial product with water or other solvent in which the resin is insoluble or by chemical means. For example if sulphuric acid was the catalyst, barium carbonate in excess may be added. The barium sulphate formed will act as filler. In case of bromine, an alcoholic solution of ammonia is added. The product in its initial stage may be dissolved in alcohol, benzene or acetone, mixed with wood flour or asbestos, and the solvent removed by heat. The mass may be ground and molded with heat and pressure. The initial product may be dissolved in alcohol or acetone, caused to impregnate fibrous or porous material and the solvent driven off after which the material may be made into a laminated structure, which is then cured by heat and

pressure. The product is suitable for phonograph records.

44. O. A. Cherry, 1,671,228, May 29, 1928. Filed Sept. 13, 1923.

Invention is directed to incorporating a wax or waxy material such as green ozokerite or carnauba wax into a record composition which may be of the phenolic condensation type or preferably of the sulphur, selenium or tellurium type, i. e. a composition made by treating a phenol or naphthalene with sulphur chloride or selenium chloride. A specific example is given wherein 100 parts of naphthalene and 100 to 150 parts of sulphur monochloride are allowed to react in the presence of a trace of iron or other catalyst and the product with or without more sulphur is melted with a small quantity of ozokerite (1 to 8 parts of ozokerite to each 100 parts of the resin). Fillers such as flock and inorganic substances may also be added. A record made from the composition is said to be characterized by a very marked improvement in resistivity toward wear and deterioration.

45. F. E. Layman & L. T. Richardson, 1,682,913, Sept. 4, 1928. Filed Sept. 13, 1923.

The patentees first prepare a composition in one of the following manners:—

1. Treat 100 parts of naphthalene and 100 to 150 parts of sulphur monochloride with a trace of iron or other activating material and 150 to 200 parts of sulphur.

2. Treat 100 parts of naphthalene and 150 parts of sulphur monochloride together with a trace of iron or other activating agent.

3. Treat 100 parts of phenol and 200 parts of chloride of sulphur with 75 parts of sulphur.

4. Treat 100 parts of a phenol with 210 parts of a chloride.

Instead of a sulphur chloride, one of selenium or tellurium may be used. The composition is then heated at 250° F. to 440° F. for about one-half hour together with about 10 per cent. of its weight of white lead in order to render it chemically in-

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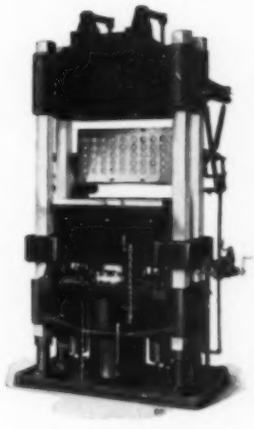

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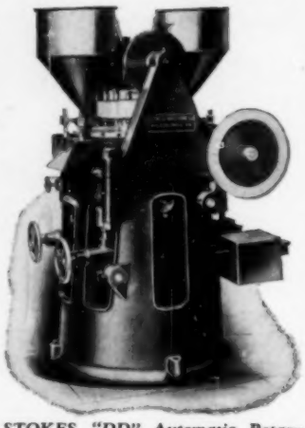

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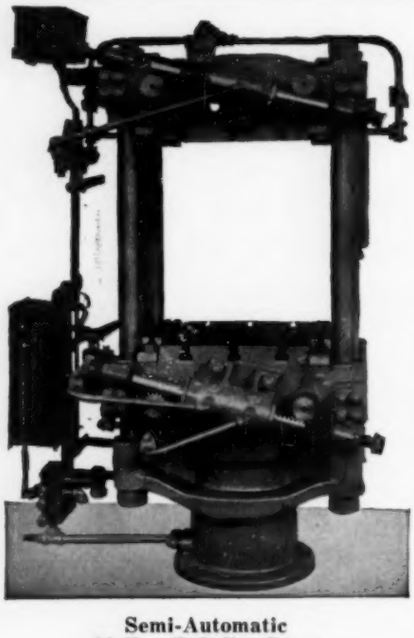

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nocuous toward the polished nickle die used to make the record and to prevent sticking thereto.

46. A. L. Clapp, 1,683,605, Sept. 11, 1928. Filed Feb. 15, 1921.

Waste paper or ground or chemical wood pulp (60 parts by weight); a water insoluble gum of the nature of rosin, shellac, copal or sandarac (25 to 60 parts by weight) in the form of coarse particles; starch (5 parts); lime (5 parts) and sufficient water to permit free circulation of stock are beaten and disintegrated and built up on the makeup roll of a wet machine. The product after being dried is fairly open and porous and not uniform but when subjected to heat and pressure is converted to a waterproof, hard, dense, compact, stiff and rigid mass which may be molded into sound records.

47. T. A. Edison, 1,690,159, Nov. 6, 1928. Filed Oct. 5, 1926.

The invention is directed to a method of applying to a record blank of the Edison type at least three coatings of the same viscosity of varnish (preferably phenol resin dissolved in alcohol), drying the coated blank in air between the applications of successive coatings of varnish, the duration of such successive drying periods progressively increasing, drying the final cooling until it sets and then subjecting the blank in a printing mold to pressure and sufficient heat to make the surface layer infusible.

An Edison record has a body portion consisting of wood flour and chalk bonded with shellac or resin and a surface veneer of phenolic condensation product containing a hardening agent such as hexa, a catalyst such as para- phenylene- diamine and a pigment such as lampblack, which is usually applied to the base in an alcoholic solution and then hardened to infusibility.

In all the patents that have been discussed the sound waves are recorded by impressing them into the thermoplastic surface of the record blank by means of a stylus or a matrix.

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Daylight Opening	24"
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Terkelsen Type F-2 may be employed for plastic molding. 20 ton capacity.

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It is also possible to record sound waves on a resinoid material without altering the physical appearance of the blank. One method that suggests itself to the writer is to interpose a source of light between a source of sound and a light sensitive resinoid coating so that the variations in the sound would affect the intensity of the light source and to be photographed upon the resinoid film. This could be done upon a moving picture film to product a talking cinema. There are several patents suggesting such a method but none of the patents that have come to the writer's attention suggest using a resinoid as the light sensitive surface.

The use of resinoids in the field of acoustics is obviously not limited to sound record compositions. Egerton in Patent 1,455,745 dated May 15, 1923, Taylor in Patent 1,514,406 dated November 4, 1924, Wickes in Patent 1,213,051 dated January 16, 1917, Houghton in Patent 1,492,982 dated May 6, 1924 and Steurer in Patent 1,459,803 dated June 26, 1923 all disclose methods of making diaphrams for telephones, loudspeakers and dictaphones from fabric impregnated or laminated with an artificial plastic. Egerton in his patent 1,475,623 dated November 27, 1923 makes a phonograph horn of laminated material bonded with a phenol plastic and in Patent 1,486,132 dated March 11, 1924 he describes a telephone transmitter button made of such material.

N. S. Clay in Patent 1,511,398 dated October 14, 1924 proposes making a phonograph needle or stylus utilizing phenolic condensation product. Fibrous sheet material such as paper, duck or muslin or loose fibrous material is impregnated with the resoid, stacked and consolidated by heat and pressure in a mold or between the platens of a press. The assembly is then cut into needles of triangular cross section. Individual needles may be molded instead of being cut from the sheet material.

It is interesting to note that Edison does not consider ordin-

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DETROIT

ary phonograph styli suitable to reproduce records made of a resoid composition. In Patent 1,041,983 dated October 22, 1912 he suggests using a stylus made of crystallized boron and in Patent 1,110,428 dated September 15, 1914 he proposes using a needle made of diamond.

Constitution of the Resinoids

(*Continued from page 385*)

given after each citation in the text (June and present installment of this article).

1.)P.P.v. Weimarn „Kolloides und kristallisches Lösen und Niederschlagen" (nach Fodor „Die Grandlagen der Dispersoidchemie" (1925)p. 15).

P.P.v. Weimarn „Zur Lehre von den Zuständen der Materie". Dresden u. Leipzig 1914.

Wo. Ostwald „Grundriss der Kolloidchemie" (1912).

A. Fodor „Die Grundlagen der Dispersoidchemie" (1925).

H. Freundlich „Kapillarchemie". (1923).

B. Zsigmondy „Kolloidchemie". (1922).

H. R. Kruyt „Einführung in die physikalische und Kolloidchemie" (1926).

2.) Wo. Ostwald „Kolloide und Jonen" Koll. Ztschr. **32**, 3, (1923).

3.)H. und A. Euler „Ber. **38**, 2551 (1905) Ber. **39**, 344 (1906).

4.) H. Mark „Die Verwendung der Röntgenstrahlen i. Chem. u. Tech." (1926). Vgl. beispielsw. die grundlegenden Arbeiten von Kurt H. Meyer und H. Mark aus dem Hauptlaboratorium der J. G. Farben-Industrie, Ludwigshafen, in Ber. **61**, 1939 (1928) „Kaustschuk".

5.) A. v. Bayer „Ber. **5**, 25, 280, 1094 (1872).

6.) L. H. Boekeland "Chem. Ztg." 1909, 317, 327, 358, 857.
L. H. Biekeland "Chem. Ztg. 1912, 1245.

7.) Raschig „Ztschr. f. ang. Chem." 25, 1946—1947 (1912).

8.) Herzog und Kriedl „Ztschr. f. ang. Chem," 35, 643 (1922).

9. H. Barthelemy „Revue des produits chimiques" **28**, 363, (1925).

10). F. Pollak und K. Ripper „Chem. Ztg." **48**, 559, 582 (1924).

11). Oesterr. Patentschriften 106980 u. 106981 (Bakelit G. m. b. H.).

12.) C. H. Bryson „Die Phenolformaldehydharze" The Industrial Chemist **1925**, 10, 73, 145.
ref. in Kunststoffe **16**, 65-69 (1026).
Kunststoffe **17**, 134, 180, 230 (1927).

Als zusammenhängende Schilderungen seien erwahnt:
„Die Kolloidchemie der Isolierma-

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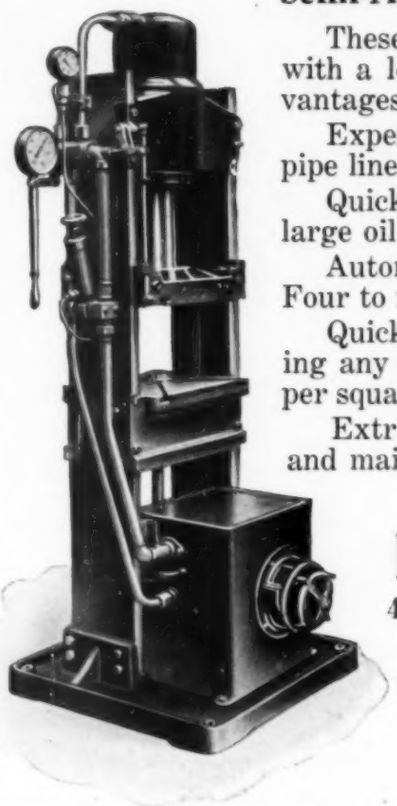

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terialien" von Stager in „Kolloidchem. Technologie" von Raph. E. Liesegang (1927),

Ellis „Synthetic Resins and their Plastics", New York 1923,

Hemming „Plastics and molded electrical insulation", sowie in

Ullman „Encyklopädie der techn. Chemie",

„Bakelit" von Weger und „Kunstharz" von F. Pollak.

Changing Trends

(*Continued from page 396*)

be, as far as the patent situation is concerned, at practically a standstill; the manufacturers evidently preferring to capitalize their skill and experience by secret processes, and manufacturing "kinks" that give them a commercial advantage. Much yet remains to be done before a really good casein molding compound can be offered to the general molding trade; although at least two concerns have molded casein successfully.

The general low tone of the plastics and molding business is doubtless giving the more far-seeing and enterprising concerns in this field an opportunity to devote the energies of their technical men to the development of new ideas, for when business again picks up, as it undoubtedly will, competition will be keen, and the concern having a better product will have a strong position in the field.

In time of "peace" prepare for "war". So those who are now in charge of plants where the production is low and the plant is partially shut down, should use this fortunate opportunity to develop new ideas, and to try them out in practice, so that they can take their share of the new business that will develop within the next year or so.

Unusual Applications of Resinoids as shown in Foreign Patents.
By C. W. Rivise
See August issue.

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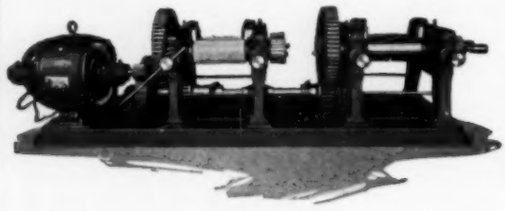

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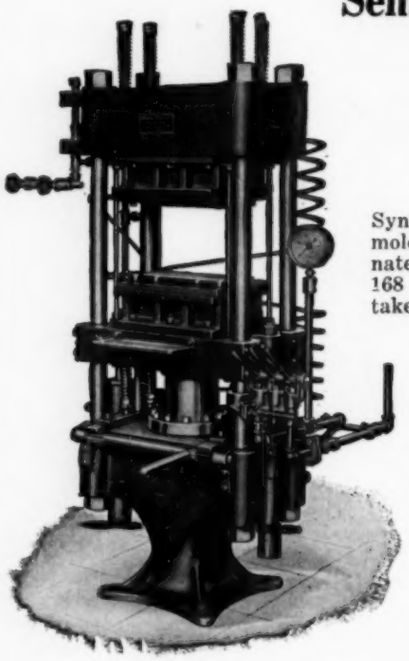

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This substance can easily be obtained by reaction of phenol with tertiary butylchloride in presence of a catalyst. As tertiary butyl-chloride or tertiary butanol are now available in large quantities as by-products in certain types of cracking processes of petroleum, 4-oxy-1-tertiary butyl-benzene can be produced at a lower price than any plasticizer at present used for cellulose acetate compounds.

Derivatives

Nucleus-halogenated derivatives of 4-oxy-tertiary butyl-benzene, such as 3-bromine-4-oxy-1-tertiary butyl-benzene (M. P. 50° C.) or 3.5-di-bromine-4-oxy-1-tertiary butyl-benzene (M. P. 78° C.) may also be used as plasticizers for certain purposes where substantially non-inflammable cellulose acetate plastic compounds are desired.

I have further found that phosphates of the class containing triphenylphosphate or tricresylphosphate or a similar substance may be added in any proportion to the new plasticizers named above without interfering with the solvent action of 4-oxy-1-tertiary butyl-benzene or if its nucleus-halogenated derivatives. The addition of the phosphates serves to render the resulting product substantially non-inflammable. Other plasticizers, being used for cellulose acetate, ethyl-acel-anilide, ethyl-p-toluolsulfamide, di-ethyl-di-phenyl-urea and similar substances, may be added to the new plasticizers in any desired proportion.

Following is an example of the manner in which the inven-

tion may be practiced:—I dissolve from 20 to 40 parts of 4-oxy-1-tertiary butyl-benzene and 1 part of urea in 600 parts of acetone or in the same amount of another solvent common to both the plasticizer and cellulose acetate. I then add 100 parts of cellulose acetate of the acetone soluble variety. Or I dissolve 10 to 20 parts of 4-oxy-1-tertiary butyl-benzene, 10 to 20 parts of triphenylphosphate and 1 part of urea in 600 parts of acetone or in the same quantity of another solvent common to both the plasticizer and cellulose acetate. I then add 100 parts of cellulose acetate. I allow the mass to soak or macerate at room temperature in a closed vessel until gelatinization has taken place. The compound may then be worked in the usual manner well known to those skilled in the art.

Abstracts

Phthalic-Urea Resin and Process of Making Same. Boris N. Lougovoy, Montclair, N. J., assignor to Ellis-Foster Company. U. S. P. 1,756,251; April 29, 1930.

A resinous material comprising the reaction products of urea, phthalic anhydride and formaldehyde.

A solution of the sirupy reaction product of urea, an organic acid, and formaldehyde, in an organic solvent.

A resinous material comprising the reaction products of a dibasic carboxylic acid, an aldehyde, and a carbamid compound corresponding to the formula NR_2CXNR_2 in which X is an atom of the oxygen-sulphur group, which compound is capable of forming an amorphous condensation product with the aldehyde.

Method of Reducing the Viscosity of Nitrocellulose. George H. Tozier, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y. U. S. P. 1,757,491; May 6, 1930.

The process of reducing the viscosity of nitrocellulose that comprises completely immersing a quantity of nitrocellulose in water in a closed vessel, introducing super-heated steam under pressure below the water level during the continuance of the process, maintaining the contents of the vessel under high temperature and pressure conditions and at the same time throughout the process withdrawing any excess of water including any products of decomposition whereby the nitrocellulose is constantly and completely immersed in water at a constant level under high temperature and pressure conditions.

Product From Organic Derivatives of Cellulose. Camille Dreyfus, New York, N. Y. U. S. P. 1,754,164; April 8, 1930.

A textile material comprising individual filaments of organic derivatives of cellulose, at least some of which filaments are permanently deformed and present a moire design which is permanent.

Plastic Composition. Archie R. Kemp, assignor to Western Electric Company. U. S. P. 1,752,746; April 8, 1930.

A filler of fused silica in a finely divided amorphous state having the surfaces of individual particles in a crystalline state.

In the manufacture of plastic compositions which contain fused silica in a finely divided state as a filler, the step of removing from the filling material absorbed and occluded gases followed by the step of forming a thin film of tridymite upon the surface of individual particles of the filler.

Aircraft Covering. Isadore M. Jacobsohn and Starr Truscott. U. S. P. 1,752,637; April 1, 1930.

A method of rendering a fabric flexible and impermeable to gases consisting in coating a fabric with a mixture of cuprammonium cellulose-latex, bathing the coated fabric in sulfuric acid, washing to remove any reaction products, immersing in a plasticizing agent, and finally drying.

Stencil Sheet. Shinjiro Horii, Tokyo, Japan. U. S. P. 1,752,205; April 8, 1930.

A stencil sheet adapted for stencilizing by pressure comprising a base of fibrous material coated with a coating material, consisting of a solution of esters of polysaccharides, other than cellulose acetate and starch acetate, which are insoluble in water, in admixture with a tempering agent, and aluminum hydroxide, the latter being dispersed in the solution forming a homogeneous suspensoid.

Polymerization of Ketone-Formaldehyde Condensation Products. Charles E. Burke, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. U. S. P. 1,755,099; April 15, 1930.

Process which comprises polymerizating a ketone formaldehyde condencation product in the presence of an organic amine.

Molding Compound and Its Method of Production. Harry Stirling Snell, assignor to Western Electric Company. U. S. P. 1,752,580; April 1, 1930.

A method of producing a molding compound which consists in precipitating simultaneously and jointly by a common precipitant a water insoluble caseinate and an insoluble salt capable of waterproofing the compound, washing and drying the precipitate, and adding furfural to the dried product.

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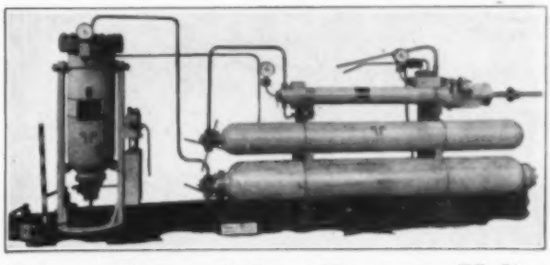

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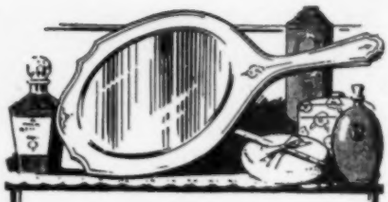

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Vol. 4 JULY, 1930 No. 7

Solving Customers' Problems Stressed At Summer Meeting

Custom Molders Wrestle Industrial Problems

By R. C. Gilmore, Jr.

PAUSING in the rush for business, the custom molders held a two day meeting in Massachusetts on June 13th and 14th. This was one of the regular meetings of the Molded Insulation Section of the National Electrical Manufacturers' Association, and it was one of the most successful and enjoyable ever staged. The Section had two competent hosts, Mr. Randall of the General Electric Company and Mr. Parker of Union Insulating, and on the first day Mr. Randall took charge, directing affairs from the Hotel Wendell in Pittsfield. In spite of the fact that the meeting was not scheduled to begin until noon, Friday, many men arrived the night before and spent the time Friday morning either on the Berkshire Hills golf course or in informal meetings at the Wendell; though, to be frank, only four—Scribner and Kendall, Post and the writer—got up in time to play golf!

A bountiful luncheon at 12:30 opened the program, 48 men being present at that time, including several guests and visitors. Each of these received a beautiful individual Autopoint pencil, made of Glyptal, as a gift from the General Electric Company. We print elsewhere a full list of those present, but special mention must be made of the fact that Harry W. Hahn, from Los Angeles, was an enthusiastic guest of the Section.

After luncheon, the moulders made a tour of the General Electric plant where they were first entertained by an impressive display of artificial lightning in the High Voltage Engineering Laboratory. To attempt to describe this remarkable exhibit would be a sorry gesture. Only one who has seen it can fully realize its wonderful appeal. Mind you, we say this in all justice to the efficient molding department, visited shortly after, that seemed to have competent workmen intensely busy on a wide variety of custom work.

Six guesses who this is!

We emphatically believe that this tour was an eye-opener to most of the molders. It occupied the greater part of the afternoon, visiting every department, and taking in such notable G. E. developments as the tube base department, with its magnificent equipment, the press and preforming rooms. Efficiency in handling seems to be one of the G. E. keynotes, especially on heavy, multiple-cavity molds.

At about 4:30, all traveled by bus or car to the Brook Bend Inn at Monterey, where Mr. Parker took over the exacting duties of host through the medium of an excellent dinner. Monterey is one of the quietest and most picturesque of Berkshire villages, although it was far from quiet during an evening spent in recreation and discussion by a group of molders! However we highly recommend it as a place for rest, beauty and fine food.

Promptly at ten o'clock the next morning, at Mr. Parker's summer estate, the business meeting was called to order by the chairman who introduced Mr. A. W. Berresford, the Managing Director of NEMA. Mr. Berresford spoke briefly on the activities and aims of NEMA in association work and of his own interest, not only in this effort, but in the various phases of industrial problems. New guests

of the Section were also introduced by Mr. Kurz before the reading of the minutes of the last meeting. These minutes were approved as read. In spite of the fact that Mr. Schlesinger had been called back to Boston the night before, he was elected Treasurer to handle the Generic Name prize-fund balance. Some slight changes were made in the form used on closed business transactions, and these met with full approval. Attention was called to the fact that watermarks had been distributed, and Mr. Kurz spoke briefly on the value of this service to the consumer. He also appointed a complete committee consisting of Messrs Rossiter, Allen, Neal, Shaw and Stratton to work on the problem of Trade Extension. This group is expected to make some recommendations at the next meeting, which was set for August 22 and 23 at the Hotel General Brock, Niagara Falls, Ontario. Unfortunately, Mr. Stone was late in arriving and was unable to make his report at this time, although it is understood that he did so at an informal meeting later in the morning.

NEMA Accountant on Costs

Although no new business came before the section, Mr. Kurz introduced Mr. T. W. Howard, NEMA cost accountant, who gave a talk on his ideas for better estimating, and the need for this type of constructive work in the molding industry. The business was concluded with a vote of thanks to the hosts of the Section for all that they had done to make the gathering successful.

At one o'clock lunch was held at the Inn, and shortly after many of the men met at the Wyantenuck Country Club, Great Barrington, for a round of golf. Practically all the members left by seven that evening, returning to their plants and jobs until the August meeting. The writer takes this opportunity to express his appreciation to both Mr. Randall and Mr. Parker for a delightful and profitable meeting. It was the universal opinion that through this one meeting the success of two-day gatherings is now established.

Member Companies Represented

American Insulator Corp.
American Record Corp.
Belden Mfg. Co.
Boonton Molding Co.
Boonton Rubber Co.
Bryant Electric Co.
Chicago Molded Products Corp.
Diemoulding Corp.
General Electric Co.
Kurz-Kasch Co.
Mack Molding Co.
Monowatt Electric Corp.
Norton Laboratories
Northern Industrial Chem. Co.
Recto Mfg. Co.
Reynolds Spring Co.
Shaw Insulator Co.
Union Insulating Co.

Guest Companies

Auburn Button Co.
Hahn, Harry W.
Plastics Molding Co.
Waterbury Button Co.

Individuals

P. Huidekoper
R. A. Allen

(*Continued on page 424*)

FILE DEPARTMENT IN NEW OFFICES OF BAKELITE CORPORATION.
Bakelite Laminated Sheet Stock is interestingly used to provide the enclosure which is in the form of a hollow square covering a floor area of 400 square feet. The modernistic walls rise to a height of 4 feet. The increasing use of plastic materials is reflected also in the illumination—the fixtures being molded of Bakelite Material and the electric light bulbs based in Bakelite cement.

Do You Sell the Chain Store? What Is a Chain Store?

By W. M. Steuart
Director of the Census

MUCH is being heard nowadays about "chain stores." As a consequence the question —"What constitutes a chain store?"—is frequently asked, with the result that a divergence of opinion is revealed. Just how many stores must an organization operate to be classified as a chain system? The answers are numerous; but, the fact is, the question itself is all wrong. Likewise the term "chain of stores", or "chain system" *per se* is variable, and not significant.

A group of stores owned by the same firm, does not necessarily constitute a chain, and taking cognizance of this fact, the Bureau of the Census has obviated the difficulties arising from attempts to define a chain system by the number of stores owned. The Census of Distribution questionnaires over-ride this controversial matter in two questions. which is to be answered "yes" or "no", asks whether the organization operates other establishments in the same line of business in the same city? In the same county? in the United States? The other asks the number of stores owned by the organization. No reference is made in the questionnaire to the term "chain stores", but the census reports will make several classifications, and as a result it is confidently expected the loose use of the term "chain" will give way to more discriminating terms and will not be so all-inclusive as it is today.

The census tabulations will carry six classifications of concerns operating, or controlling stores. They are: independent stores, local branch systems, local chains, national chains, ownership groups, and cooperatives.

Local Chain Systems

Obviously, Independent stores are those owned and operated by a proprietor, partnership, local company or corporation. Local Branch systems are suburban or subsidiary stores operated in the same city by a large downtown store, and drawing their merchandise largely from the downtown store's stocks. The Local Chain is a group of stores operated throughout a city or trade area by local and independent operators from a central office and warehouse, but without any main central retail store as the source of supply. Ordinarily, of course, there may be more stores in a local chain system than in a local branch store system.

The National Chain system includes those large organizations which operate stores throughout the country, whose interests are not confined to any one community. The Ownership Group is comprised of a group of entirely independently operated stores owned by the same persons or firm but merchandised separately, while the Cooperative classification is composed of groups of independently owned stores that cooperate in their buying, or cooperate with a wholesale company in their merchandising.

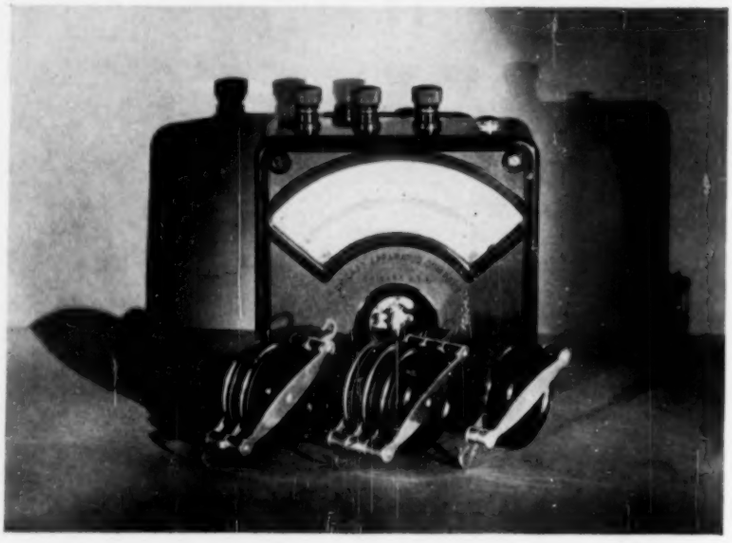
These classifications might seem to involve a hair splitting process, yet the extent and characteristics of the various kinds of merchandising enumerated are of great significance to the communities in which they are located. So far as the community is concerned, both the branch and local chain stores are independents, truly homefolk, with the advantage and disadvantage that this implies. The method of merchandising, and the place where the decisions as to buying and policies are made, constitute the significant difference between local stores and national chains.

The preliminary reports will carry tabulations based on these various types of group merchandising as well as on the size of the organizations, which will indicate the spread and relative importance of each such form of retail busi-

(*See page 424*)

Photo Courtesy Bakelite Corp.

Choice of phenol resinoid molding material for the "Barcol" Fan insured economy of manufacture, high electrical insulation, durability, and beauty of finish. The molded elements include base pedestal, motor housing, and guard center.



Molded Bakelite pulley block units replace metal while the resinoid molded volt ammeter case is substituted for wood.

Physical Laboratory Equipment Produced by Chemists' Efforts

IN the physical testing laboratory Bakelite materials serve many useful purposes. After all, it is quite appropriate that they should perform a useful function in this environment because it is the physical laboratory, in turn, which has guided them to an increasing range of applications founded upon standardized physical properties. Many of us are familiar with the little metal pulleys which we have used in experiments to determine moment of force, viscosity by the falling weight method, the effect of a spring, or the balance of a lever. Now, Bakelite molded material has replaced metal in the making of these laboratory pulleys. The new wheels are absolutely true, and are not subject to rust or corrosion. Accordingly, they retain the free running quality which is so necessary for this particular item in the experiments for which it is used. It is said, in fact, that resinoid pulleys run freer and with less friction than do the metal pulleys when new.

A contrasting use in the physical or electrical laboratory is found in the adoption of Bakelite material for the cases of ammeters, volt meters, watt meters, and standard cell units for potentiometric reference. A typical voltammeter, made by the Chicago Apparatus Company, reveals Bakelite cases taking the place of wood. The old wooden cases were subject to warpage. It is said that, after a brief period of use in the laboratory, distortion in the joining of the wood would allow dust to enter the delicate movement of the meter, impairing its accuracy. There is an equally impressive advantage from the standpoint of manufacturing. Cost has been reduced by the relatively simple assembly of the Bakelite molded case. Bushings, rod supports, threaded assembly inserts, etc., are easily incorporated at the time of molding. Formerly, they had to be assembled in the wooden case. Significant, also, is the fact that the new case comes from the die complete, and colorful, thus obviating the operations of machining and polishing, likewise, the processes of staining and varnishing.

CLARKSON RESIGNS AS ASST. DIRECTOR OF NEMA

Handled Molders' Affairs

STEWART N. CLARKSON has resigned as Assistant Director of the National Electrical Manufacturers Association, and established offices at 522 Fifth Avenue, New York, for the purpose of rendering an intimate trade association service to a few groups of competitive manufacturers. Mr. Clarkson functioned in a similar manner as Executive Secretary of the Electric Power Club for five years and for the product sections of the National Electrical Manufacturers Association since its formation in 1926. During the past three years he has organized into cooperative trade association groups, manufacturers of furnaces, refrigerators, carbon brushes, molded products, lighting equipment and signalling apparatus, to promote the interests of and improve the conditions in their respective industries. His former activities were devoted to the merchandising, manufacturing and public utility branches of the electrical industry.

After leaving Sydney (Australia) Technical College he was with the Westinghouse Electric and Manufacturing Company from 1906 to 1910, when he became connected with North American Company properties for eight years,—the Union Electric Light and Power Co. of St. Louis, and the Milwaukee Electric Railway and Light Company, as Assistant Sales Manager and Sales Engineer respectively. He left the public utility field to become Associate Western Editor of Electrical Merchandising and Electrical World, which work he followed until 1921 when he was appointed Executive Secretary of the Electrical Power Club, and with which he remained until its consolidation into the National Electrical Manufacturers Association in 1926. He has been

active in Industry affairs, and is past Chairman of the St. Louis Section of the American Institute of Electrical Engineers.

Durez Has Good Properties in Molded Ignition Coil Tops

THE proper functioning of the ignition system is dependent on a number of things but not least among these is the phenolic molded parts that form the distributor cap head and the ignition coil tops.

The specifications and dimensions on coil tops are probably the closest required of molding compounds in any job they have had to do. The electrical requirements are also unusually stiff. The finished part is subjected or should be to most exacting inspection for any slight imperfection will prove disastrous in the ultimate use of the piece.

Of materials used for these parts, manufacturers generally have found Durez quite suitable and its use is practically universal in these parts today.

On dielectric tests the type of Durez for this work averages over 450 volts per mil. The test of 20,000 volts on ignition coil tops has always been considered a very stiff one but Durez coil tops have been tested up to 38,000 volts without break down. This particular part is undoubtedly one of the most difficult parts of all to mold. Material must flow in two directions, up into a thin skirt and down around an insert into a long tower. In addition to this, there is the problem of holding the material properly in the mold during this flow due to the metal that is held at the parting line of the mold. In five different plants, Durez has been found to give better results on this part than any other phenolic materials. The specific advantages found were; a more solid, better finished piece, a higher resistance to breakdown, less tendency to flash over and what is most important, few rejects.

The completely assembled Doo-Tee Seat.

Mothers and Infants Endorse the Doo-Tee Seat Molded in Durez

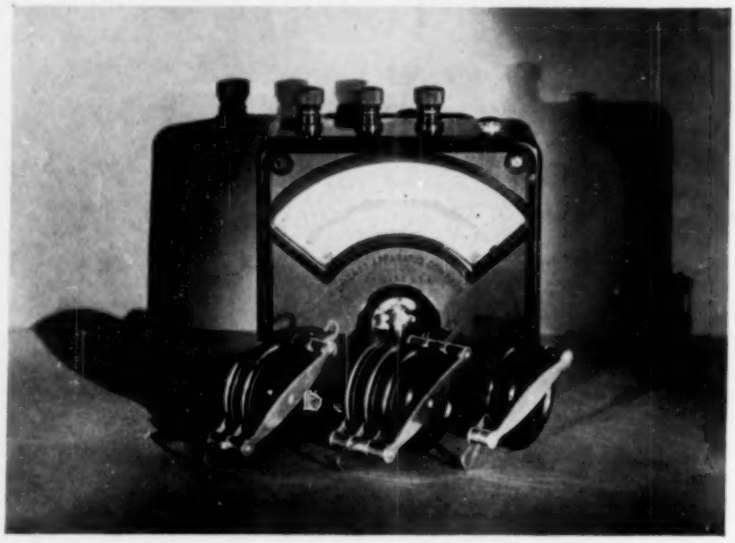
THE mothers of the nation and Chic Sale will like this Doo-Tee seat. The mothers will understand, and assuredly the specialist, on a once-over, will sum up the advantages and "I'll tell you why".

The Doo-Tee seat is sanitary, it is molded of black Durez, decorated in bright yellow, red and white. It is well designed and protected by rubber guards so that it will not mar the permanent equipment.

It has been endorsed by physicians and leading authorities. It will of course, not warp, chip or split. It is warm to the touch, light in weight and interesting as a molding job as it is made in three pieces; the head being in two sections and the seat and back entirely in one, and is meeting the enthusastic approval of the small public for which it was designed.

As noted before, the seat and back are of one piece. Of special interest to the molder is the size of the seat, the depth of the back rest and the mode of reinforcement with adequate strength yet a saving of material.

The component parts of the molded Doo-Tee Seat, showing the ingenious design from the molding point of view.



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Modern and Classic Styles are Featured in 1930 Fall Boudoir Ensembles

Prominent Artists Design Toiletware in DuPont Pyralin

By P. A. Dillman

WHAT kind of accessories does every woman want for her boudoir? More than anything else, she wants colorful decorative articles that will go well with her clothes, harmonize with her furniture and suit her personality. In short, things that follow Fashion's supreme law of the Ensemble.

It was for this reason that du Pont commissioned noted artists to create new designs that would allow the ensemble idea to be carried out when purchasing a set of accessories for the boudoir. Some of the artists, such as Verna Cook Salomonsky, Ben Nash and Ethel Parsons, had previously designed boudoir sets but others, like Robert Leonard, Margaret Pritchard and Burton Keeler, made their debut in the toiletware industry by creating new ensembles for the 1930 du Pont line.

Back in 1929 du Pont started an entirely new vogue in boudoir accessories with the introduction of Lucite. The new creations which were brought out the following year spread this vogue rapidly until there is today a growing demand for carefully styled, quality toiletware ,truly appropriate for the boudoirs of today.

New Designs For 1930

This year again, du Pont introduces many new features which will more firmly establish this new vogue. The four new Lucite patterns represent a distinct advance in the toiletware art. Adam is reminiscent of one of the finest art periods of old England; Fleuret combines the dash and spontaneity of the French with the American idea of modernism; Trianon is truly feminine in the Louis XVI manner, with its long graceful mirror and its exquisite green and peach colors; and Monticello contains those same style elements which are so highly prized today in rare glass, china, silver and other art objects of the American Colonial period.

Two distinctive new patterns have been added to the Pyralin line for 1930—Lustris and Madelon. Both are priced for quick turnover and designed to appeal to that great mass market which represents the big volume in toiletware. Lustris, with its gleaming satin-like surface on crystal-like base, introduces an entirely new and striking effect. A radical departure is the branding of the lowest priced sets with the name Arlton, in order to help retailers meet acute competitive conditions as they come across them.

The Adam Pattern

A closer study of the individual du Pont patterns for 1930 reveals many interesting phases in connection with the creation of new toiletware designs. The form and plan for the Adam pattern, for instance, were inspired by the decorations of an Adam ceiling in an old English home of the 18th Century. Robert and James Adam were the principal founders of a revival of classical art in the 18th Century and the decoration of the Lucite Adam pattern bespeaks of the grace and symmetry of that period. The light, delicate, graceful decorative motifs, which are always found in an Adam design, can closely be seen in the simplicity and dignity of this du Pont pattern. Seeking to create an appropriate design for the many boudoirs of early American and English origin, Ben Nash drew this con-

DuPont Viscoloid's new Monticello brush and powder jar, and the Adam pattern brush.

ception from the Adam period. Miss Margaret Pritchard, an authority on 18th Century design, executed the design.

The Fleuret Pattern

Nothing brings an atmosphere of feminine charm and loveliness to a set of boudoir accessories like the design of a flower. That is probably why Robert Leonard made an abstract floral design when commissioned to create a new set of accessories for the young girl of today. Combining the dash and spontaneity of the French with the practicability of the new world, Leonard has conceived a charming and spirited design in the du Pont Fleuret pattern.

The peculiar fascination of design is its puzzling sort of incompleteness which suggests rather than realizes actual form. Its spirited dignity and simplicity will have a general appeal as Mr. Leonard has thought to detach the design from any particular place or people. He is one of the few modernists who possesses that dainty and gracious feeling so necessary in designing feminine articles, which is quite noticeable in the Lucite Fleuret design.

The Trianon Pattern

The colors of the new du Pont Trianon pattern were selected to fit right into the newest requirements for the boudoir. French in form, color and design, Trianon is a pattern of utmost grace and dignity, with graduations of tooling on the edges that lend a fine delicacy to its design movement and its shapeliness.

The lovely green Trianon set, with touches of peach and blue for warmth, will be recognized immediately as most appropriate for rooms decorated with either of the popular new color schemes—green and orchid or peach and green. The exquisite peach colored Trianon set will be welcomed by women where boudoirs are decorated in peach and green.

The du Pont Trianon pattern is an authentic French Louis XVI design, modernized to meet present-day tastes. The decorative motifs of the so-called French "Louis" periods are essentially feminine and therefore particularly adaptable for use in the ornamentation of articles to be used in the boudoir. The Louis XVI period is especially noted for its feeling of feminine refinement and subtle tones of delicate color, and offers one of the happiest inspirations for a new design in toiletware.

When adapting historic motifs for use today, it is necessary to infuse them with a certain feeling of modernity. The Louis XVI motif on the du Pont Trianon pattern was adapted by Burton Keeler of New York, winner of many prizes for designs, among which the Traveling Scholarship of Europe Award of the Academy of Fine Arts, is the most outstanding. Mr. Keeler, also designer of textile and household products, is fitted unusually well to adapt historic motifs to articles that adorn the home.

The Monticello Pattern

Monticello is thoroughly American in form, color, design and inspiration. Reflecting the best artistic tastes of the early American colonists, it will appeal to a great number of people because it has a particular type of refinement in shape and color that is characteristic of the best early American arts.

The shapes of the Monticello articles were based on the works of the best Colonial silversmiths and architects. The ornamentation of flowers and the pheasant-type bird in the oval medallion recall the decorations painted on chests by the American colonists. The two distinct color combinations give a certain piquancy to the set which is so much sought after today in toiletware.

One of the most outstanding features of the Monticello pattern is the variety of the design on the individual articles. This is purposely done so as to give an added note of individuality to the set and makes the first time that it has ever been accomplished in decorative toiletware. The gold plated steels in the blue set are also an entirely new feature this year.

The Lustris Pattern

Lustris is one of the loveliest

(*Continued on page 423*)

Lustris and Fleuret mirrors and the Adam powder jar, newest patterns of Lucite Toiletware.

There's *Good* News in the Sales Trends of Today

By Benn C. Budd
Celluloid Corp.

AS startling as a copy of "La Vie Parisienne" at a prayer meeting has been the sudden realization that a new sales trend has definitely arrived.

On Fifth Avenue and out in the smallest hamlet it is affecting sales. From coast-to-coast, in every industry, it is challenging business to a finish fight.

Profits for the future depend on the creative thinking of today. Decisions can no longer be postponed—time, tide and a sales trend wait for no man. Is there *one* executive in the whole country who is not asking himself these questions—Shall I retrench or splurge? Shall I cut prices or stand pat? Shall I increase or decrease my advertising? Shall I hire more salesmen—or fire a few? *Is my product in tune with the times?* And last but not least—What is this new trend that's affecting my business?

New Distribution Trends

There are hundreds of factors that are part and parcel of the modern trend, in fact the whole system of distribution is undergoing a radical change. Mergers, chain stores and chain wholesalers, cooperative advertising, these are but a few of the evidences of change.

And, believe it or not, every one of these changes is affecting molders and molded products! Let's take just *one* change and see what it means to molded product volume. This change can be broadly termed the "Beauty Trend." It first made its appearance in the form of *color*. A few daring manufacturers added color to their products—and sales increased amazingly. More and more products went "color"—and sales

Mr. Budd was recently appointed assistant to the Vice-President, in charge of market development on Lumarith.

records were smashed to smithereens! Pots and pans, cameras and compacts, bed sheets and kitchen stoves, these and thousands of others all appeared in color. Today the telephone in color has made its appearance.

But color is only a part of beauty. That intangible something that diamonds, pearls and rubies possess is beautiful, too—and it's not color.

Color and Beauty

Color has whetted an universal appetite for beauty. Now the trend is for real beauty—beauty of color, beauty of color effects and beauty of form. Combine these three and you have the beauty that makes a Rembrandt priceless—a Cloisonne vase of value—a Jade statue a museum piece.

This real beauty is the most potent selling force in existence today. It overcomes price resistance, creates an insatiable desire for possession and sells—and sells—and sells. And ninety nine out of a hundred firms will tell you that their big problem today is *sales*.

Business is keyed up to a pitch where you only have to mention a new way to increase sales and you are deluged with questions. For instance, we sent a letter to one thousand firms and mentioned "Lumarith's" ability to increase sales. Within a week four hundred wrote, wired or phoned for more information. And over 60% of these inquiries were from Presidents or General Managers!

The Molder's Interest

There is *good* news for molders in this new *beauty* sales trend. Vast new fields, never before users of molded articles, are today real interested prospects. Business *knows* that when you add beauty to your product you add volume to your sales.

Look on page 71 of the Saturday Evening Post of June 7th and you will read this:

"We are now entering upon a new period of extraordinary culture . . . of *luxury*, opulence, *beauty, unparalleled in history.* And this age of greatest culture is likewise built on a plenitude of cheap labor. Fortunately, however, this cheap labor is in the form of mechanical energy which frees human beings instead of enslaving them."

"With good wages and more leisure time, *an entire people* instead of a limited upper class . . . can now express the old repressed desires for higher forms of culture. And this means, simply, a cultivated sense of *discrimination!*"

"We have, in fact, definitely entered a new period of competition in excellence.

"Almost everything today that is offered for sale must finally be sold on points that

transcend fundamental mechanical efficiency. Manufacturers and merchants must give an intangible something more of excellence to overcome the competition of other products essentially as good as their own."

"There are no exceptions to this principle. Products must be more attractively packaged. Kitchen utensils must add beauty of color and form to serviceable quality. The bathroom and all its *accessories* are things of beauty. Excellence must be an element of your product."

Hundreds of thousands of manufacturers in the country are reading this message. They are looking for something that will enable their product to meet this new trend. And sooner or later they will discover that the newest of all molding materials is in tune with the trend. For in all our 62 years in the plastics industry we have never seen a new material receive such instant, enthusiastic acceptance as has Lumarith.

When 1930 is past history, part of the story of this eventful year will be that of a new material, so perfectly keyed in with the new trend that it enabled hundreds of products, utilizing its sales stimulating beauty, to break through to new sales records in a year famous for its sales difficulties.

And it will be remembered by many molders as the year that enabled them to break out of conventional utilitarian molded article production and crash into a vast new luxury market previously dominated by paper, glass, and metal.

BAKELITE MOLDED HOUSES THE ARCTURUS ELECTRIC EYE

IN these days of electric eyes, robots, and television, the conjoined use of light and electricity serves a variety of practical purposes. The Photolytic Cell, which is the subject of this account, was recently investigated with respect to the field in which it is chiefly applied. Most important were found to be the following:

1. Sound Reproduction.
2. Selecting, Counting and Correlating Devices.
3. Chemical Analysis and Inspection.
4. Photometric Applications and Light Control.
5. Fire and Smoke Detection.
6. Television and Facsimile Transmission.
7. Medical Art.
8. Color Analysis.
9. Criminal Detection.

As we understand it, the new Photolytic Cell depends on what is described in more technical language as a photo-electric effect. An engineer visiting the laboratory where it is made reports the following experiment: "Vibrations over the victrola record were changed into light by means of an ordinary glow lamp. The rays of the glow lamp were made to impinge upon the eye of the photo-electric cell, which was, in turn, connected to an amplifying device and loud speaker. The original sound waves were thus quite perfectly reproduced. The insertion of a magnifying glass between glow lamp and Photolytic Cell served to increase the magnitude of the light impinging on the cell, and this magnification was immediately translated to an increase in tone volume from the loud speaker."

Strength and Compactness

The cell itself is constructed to be compact and attractive, as well as effective from the mechanical and electrical standpoint. In overall dimension it suggests a miniature projectile or a bullet-shaped automobile headlight. The main body of the housing is molded of orange-color Bakelite material while the back closure and lens aperture rings are molded of the same synthetic resinoid material, but in the contrasting color of black. Prong-shaped brass electrodes project from one part of the case to provide for location of the device by plugging into an ordinary four-prong tube base only two of the four contacts being used however.

From a description of the device it is obvious that its electrical insulation properties are well safeguarded. The makers are to be commended for having achieved mechanical advantages and attractive appearance as well. The uses of the device commend it to the writer of fiction no less than to the technical editor, because they range from the detection of criminals to chemical analysis.

Photolytic cell case elements showing variety of form and mechanical detail readily obtainable in unit molding operations. Bakelite material in tones of black and orange provides color contrast as an additional feature.

Teach Your Salesmen to "Cultivate" Instead of "Canvass"*

By Harry Simler
American Writing Machine Co.

LET us stop instructing our salesmen to "canvass their territories."

There is nothing we ask a salesman to do that he so dislikes, resents and fails to do, even to the extent of deception, as "canvassing."

When sales managers first used the word in conventions and their written manuals, they probably had in mind its broader meaning. To investigate a territory's possibilities, to follow-up prospects after investigation, to stimulate business by personal calls of any nature, was "canvassing" in the accepted old-time sense. To reason with a prospect, to consider a customer's needs, to establish a friendly footing and leave the way open for a return visit, was good "canvassing."

But it takes time to canvass a territory. Salesmen who work on a salary basis will do it, and their house enjoys a profitable business with a well satisfied and well estabilshed trade. Commission salesmen have to be urged.

The High Pressure Manner

And not long ago a new element came into the picture—the high-pressure sales manager. From this dynamic individual's desk came the ultimatum: "Make a sale on every call—see only people who will buy—don't waste time with folks who are not immediate prospects."

The salesman who lacked imagination took this high-pressure doctrine literally, stopped his "canvassing," and wondered why his sales fell off. Often enough, when the fifteenth of the month found few orders booked, few inquiries coming in, he was told, as a last resort, to get out and "canvass".

Now when you *canvass for orders*, you're soon discouraged, especially if you work on a commission basis. You soon decide to call on So and So, who may be in the market now. You close everything in sight that you can force; and on the first of the month you have to hunt prospects with no *groundwork canvassing* to help.

So I say let's stop "canvassing."

Let's change our terminology and ask our salesmen, not to canvass, but to "cultivate" their territories.

In order to *cultivate* a territory, we must awaken the imagination of our salesmen. Show them how necessary it is to get detailed information about their customers' need for our product. Show how they can serve and not always try to sell on a cultivation call.

We must put over the idea that there's just as much of a thrill in accomplishing what you set out to do during a cultivation call as in securing an actual signature on an order blank. We must instil in our men the long-time viewpoint, get them to realize that every cultivation call establishes a sound basis for future large-scale selling. We must stress the thought that if a salesman *always* tries to sell and sometimes fails, he will stop cultivating his territory, just as he has stopped canvassing it.

To cultivate a field the farmer has to plow, harrow, plant, cut, gather, thresh and take his grain to the market before he sells. It's a long process to cultivate the soil.

Try to get volume business and you will fail, if you neglect to go through the same lengthy procedure, call it what you will. I say call it "cultivating" a territory.

Cultivating a customer of prospect is to render him sensible to the advantage of the product, sharpen his desire for it, convince him of the service he will derive from its use.

Cultivating means to promote your proposition, advance your interest, enhance the value of your merchandise in the mind of the prospect, foster his goodwill.

Consult Customer's Wishes

Cultivating means to nourish the account, to nurse it along, to give service—not just promise it, to oblige the customer, to accommodate him, to consult his wishes, to humor him, to encourage him in the use of your merchandise.

To find more uses for your product, which means more business, to be friendly, amiable, and not to waste your customer's time—this is cultivating a territory.

To cultivate a territory you have to serve an apprenticeship, to prove yourself, your house and your goods.

To cultivate a territory you must leave a prospect in that frame of mind which will assure your welcome when you return.

To cultivate a territory you must enter a prospect's office with a smile—not a grin—know your proposition, avoid discussion of matters which do not relate to your business and his, and then dismiss yourself without waiting until he hopes you will leave.

Cultivating a territory means to get all the information possible on which you can sell your product—by frequent cultiva-

(*Continued on page 423*)

*Reprinted from "Printer's Ink"

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Guide Book

For the Plastics Industry

The 1930 (4th) edition is now being printed. It has been revised from cover to cover, is handier (pocket size) and more complete. No blind alleys. Every listing in its four sections contains anthentic information, what and where to mold, fabricate, buy or sell—all your questions answered!

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NEWS *of the* INDUSTRY

Celluloid Corp. Changes

MR. W. M. Buttrick, Vice President of Amerith, Inc., was made Vice President and General Manager of Amerith, Inc. Mr. S. E. Palmer, having been elected Assistant Secretary of the Celluloid Corporation at the last meeting of the Board of Directors, resigned as Vice President of Amerith, Inc., and assumed his new duties in addition to other responsibilities in connection with sales analyses and distribution. Mr. R. P. Piperoux was elected a Vice President of Amerith, Inc., and took over the styling and designing of toiletware, together with other duties previously performed by Mr. Palmer in connection with planning and factory contact.

Mr. A. C. Johnston was appointed Superintendent of the Articles Department, succeeding Mr. R. P. Piperoux. Mr. J. G. Mac Kie was appointed Assistant Superintendent of the Articles Department, succeeding Mr. A. C. Johnston.

Canadian Tariff Schedule

THE recently enacted Canadian tariff act affects pyroxylin plastic materials. Partly manufactured material is dutiable at 10 percent, manufactured pyroxylin plastic articles at 35 percent. British preferential rates in the case of the former are free; the latter being dutiable at 15 percent.

KUHN and Jacob Machine and Tool Co., Trenton, N. J., moulders of plastic materials and builders of moulds, announce that they are being represented in the Metropolitan and New England territories by Mr. H. L. Amdury.

The Rubber & Celluloid Products Co., Newark, N. J., proprietor of the Rubberset Co., has elected the following new officers: president, Mrs. E. A. Spurr; vice president and general manager, H. G. Russell; vice president and general sales manager, J. H. Galloway; vice president in charge of operations, T. B. Denton; vice president in charge of sales, W. R. Wright; treasurer, Frank Fedderson; secretary, J. S. Hays. The former officers were: president, Andrew Albright; treasurer, H. B. Albright; assistant treasurer, Andrew Albright; secretary, T. M. Kays. Andrew Albright resigned because of ill health. Mrs. Spurr is his sister.

Manufacture of Phonograph Records in Poland Planned

THE firm Polskie Zaklady Fonograficzne has recently been organized in Poland for the manufacture of gramophone records, according to Assistant Trade Commissioner Gilbert Redfern, Warsaw. A plant has been purchased in Warsaw and it is now being equipped for the production of records. It is expected to be in operation in about two or three months, with a tentative production schedule calling for an output of 1,000,000 records during the first year.

DuPont Viscoloid Articles Department

Effective June 1, 1930, the Arlington Articles Department and the Leominster Articles Department of the Du Pont Viscoloid Company were consolidated into one department to be known as Du Pont Viscoloid Articles Department.

Effective June 1, Mr. D. F. Carpenter was appointed general manager of the Du Pont Viscoloid Articles Department; and Mr. C. F. Brown was appointed special assistant to the president.

Notes on Recent British Developments

THE erection of a big factory has just been started by Bakelite, Ltd., on a thirty-acre site at Tyseley, Birmingham. James Swinburne, F. R. S., chairman of the company, laid the foundation stone of the new works recently in the presence of a gathering of the staffs of Bakelite, Ltd., at London, Birmingham, and Darley Dale. The new plant will comprise a very extensive range of up-to-date buildings specially designed to meet the highly organized production of Bakelite materials and products. It will include chemical, electrical, research and testing laboratories and a suite of offices. A portion of the factory site has been allotted to the firm's sports and social club.

In the past it has been found that trouble has often arisen

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HUDSON chose Textolite for this throttle disc on the 1930 models—for its strength, durability, and beauty. • Custom-molded by General Electric, Textolite is the result of twelve years' experience in producing more than half a billion moldings. • Take advantage of this experience—and of General Electric's service and facilities—to utilize fully the many inherent advantages of phenolic-resin compounds. • Talk over your requirements with the Textolite specialist in your district. You can reach him through the nearest G-E sales office.

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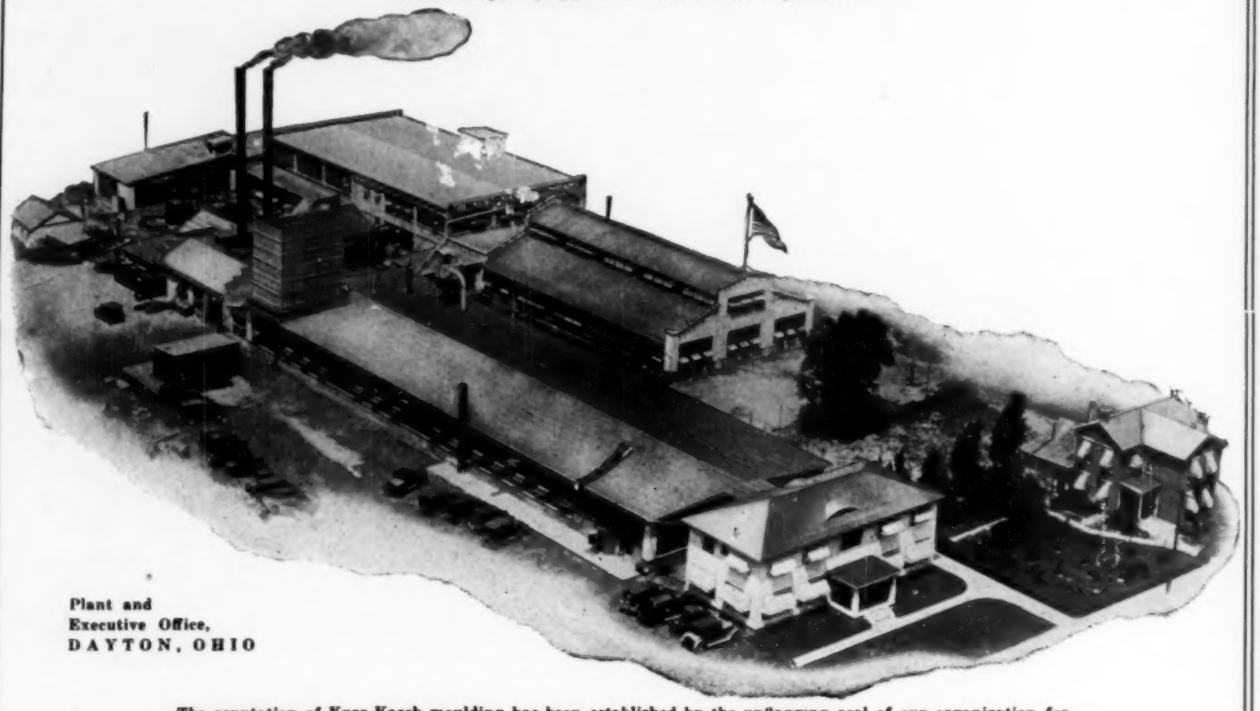

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Dayton, Ohio

MOULDERS OF PLASTICS

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in the drilling of various synthetic resin materials through the action of the material causing the drills to clog rapidly, thereby necessitating their constant regrinding. In order to overcome this problem, the Sheffield Twist Drill & Steel Co., Ltd., has just introduced a special high speed steel drill with extra wide flutes, a coarser angle of twist, and a considerably keener point grind. The drill has given particular satisfaction for the drilling of bakelite.

An entirely new industrial white molding powder requiring no special conditions for use has been developed by the Beetle Products Co., Ltd., Oldbury, which firm has been a pioneer in the manufacture of white molding powders. This new powder does not require chomium plated or stainless steel molds, a feature which will be specially appreciated by molders in the electrical trade who will now be able to use their ordinary steel molds for turning out white and cream materials. There are numerous articles now pressed in dark colors for which there is also a demand in white, and the new powder will enable molders to meet this demand without modification of their existing molds. It is also claimed that the new powder flows easily and cures rapidly, which seems to make it a powder meeting all the requirements of the molding trade in white. The normal molding temperature of 140 to 150 degrees C. is employed in pressing from this powder. The sponsors of the new product consider its introduction an import-

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Producers of the finest
in Molded Parts for
thirty-eight years

Shaw Insulator Co.
Irvington, N. J.

SHAW

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ant step forward in the development of urea resins.

Prehn Coming to U. S.

PLASTICS' German correspondent, Heinrich Prehn, will arrive in New York on August 2 for a two months' visit. In that time he will go to Philadelphia, Washington, Chicago, Milwaukee, Detroit, Boston and Toronto. Mr. Prehn is a widely known authority on plastic materials and processes, is the author of numerous books and articles on these subjects, and is head of a large manufacturing company in Naumburg. Anyone interested in German methods or in discussing commissions with Mr. Prehn is invited to communicate with this office.

New Publications

Pyrometry

MODERN industry has long needed an accurate and rapid means for determining the temperature of flat and curved surfaces. These temperature readings must be obtained under working conditions whether the surfaces are stationary or in motion.

By successive improvements in the construction of the thermo-electric pyrometer, the Cambridge Instrument Company has perfected a series of simple, accurate instruments for quickly and easily measuring the temperature of stationary and moving surfaces.

The new Cambridge Hand, Extension and Mold type pyrometers are described in their new Booklet 194-S, which will be sent to anyone who requests it.

Rosin in Synthetic Resins

With an increasing interest in synthetic resins of all kinds

Put your moulding problems up to NORTON

Now, Norton Laboratories and Norton Engineers are willing and anxious to give full estimates and other data on your moulding requirements.

Fidelity to requirements, well equipt laboratory and moulding plant, and prompt shipment of completed parts places Norton in a most favorable position to serve you.

Send engineering data for complete estimates on your present or future moulding needs.

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Appleton Street **Cincinnati, Ohio**

and many specific requests for information pertaining to materials of the amberol type, the Pine Institute of America has issued a bulletin entitled "Rosin in Sythetic Resins". Copies may be obtained without charge by writing to the Pine Institute of America, Jacksonville, Florida.

In the present bulletin the literature concerning the use of rosin in synthetic resins has been reviewed and is recorded in the form of abstracts. Much of the work has been of an industrial nature and most of the references are from patent sources. No effort has been made to cover the following more or less closely related subjects: purely scientific articles on rosin or abietic acid in which certain esters are prepared as an incidental part of the main problem; the preparation of metallic salts of rosin, such as limed rosin; the use of rosin, or synthetic resins containing it, in the production of varnishes, lacquers, etc.; obviously simple mixtures of rosin with other materials; the use of turpentine, pine oil, pine oleoresin, pine tar, etc., in synthetic resins.

The bulletin was prepared by W. B. Burnett, Fellow of the Mellon Institute of Industrial Research.

New Japanese Journal

The first issue of *The Japan Specialties*, a new publication devoted to the distribution of pyroxylin plastic articles, and published in English, has made its appearance. It is a companion to the *Nippon Celluloid Jiho*, whose editor, Mr. R. Sekido, has frequently sent PLASTICS reports of the industry's progress in the Orient. The purpose in distributing the new journal is to acquaint foreign countries with the extent of Japan's pyroxylin products as well as such specialties as pearl essence, imitation pearls, fabricated articles and camphor. The paper is written in excellent English, well edited, and contains a representative amount of trade advertising.

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Cultivating Territory

(*Continued from page 416*)

tion calls. Then, if your work is well done, your customer will buy from you—you will not sell him—and a man who buys your product is a better satisfied customer than one to whom you sell.

New Du Pont Styles

(*Continued from page 413*)

toiletware patterns ever created. More than a year of constant experiment was required to develop the new surface material and to perfect some of the new process for finishing the articles.

It features a distinctly new satin luster surface effect on a crystal-like base. The shape is also new and the dainty gold and black decoration harmonizes particularly well with the colors of the set.

The Lustris mirror conforms to the natural contours of the face and enables the woman to see her entire face at one glance without distortion by an irregular outline of the glass. The mirror is finished ON BOTH sides with the same satin luster effect. Something particularly new in toiletware is the arrowhead bevel on the Lustris articles. The crystal-like base extends beyond the surface and, gradually increasing in width as it approaches the handle, gives a contrasting effect that is entirely different.

For Today's Lovely Boudoirs

With all of these lovely ensembles to choose from this year, it will be easier for the woman to find the perfect ensemble for her particular boudoir. Each du Pont pattern is obtainable in various sized sets or in individual articles. Because every woman treasures the hours that she spends at her dressing table, these colorful du Pont ensembles will give her

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A new toy-wagon wheel, molded in Bakelite in our pressroom.

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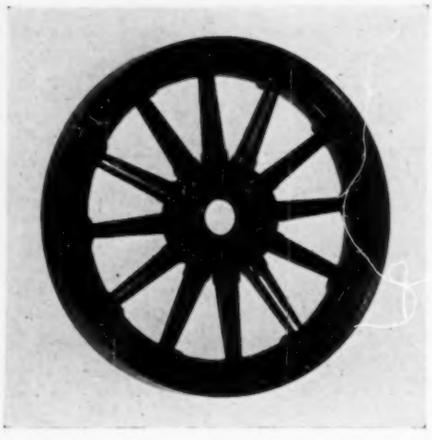
TRENTON ~ ~ ~ ~ N.J.



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years of endless delight and use. And, because du Pont has asked noted artists to design correct accessories for the boudoir, she is sure to have something that is authentically correct in style, color and design.

NEMA MEETING

(*Continued from page 408*)

F. C. Marquardt
L. F. Stratton
G. Scribner
R. W. Post
R. C. Goodspeed
B. P. McKinley
E. F. Bachner
D. Dew
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F. J. Groten
J. B. Neal
G. C. Wilson
J. S. Berthold
B. V. Schlesinger
H. N. Backscheider
R. A. Austin
J. G. Rossiter
F. H. Shaw
J. H. Parker
D. Woodruff
W. A. Freyer
H. W. Hahn
J. W. Anderson
W. F. Riebold

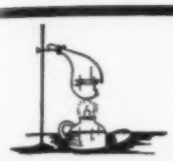
Others Present

R. C. Gilmore, PLASTICS
H. Swann, Bakelite
G. Brown, Bakelite
Ed. Slater, U. S. Indus. Alcohol
J. W. Criss, U. S. Indus. Alcohol
A. W. Berresford, NEMA
T. W. Howard, NEMA
J. J. Quigley

What is a Chain Store

(*Continued from page 409*)

ness. The final tabulation will carry this information in detail, geographically and by various lines, and as a consequence will be of out-standing use to the business world generally.



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Manchester Mfg. Co.
Monowatt Electric Corp.
Northern Indus. Chem. Co., Boston, Mass.
Norton Laboratories, Lockport, N. Y.
Recto Mfg. Co., Cincinnati, Ohio
Shaw Insulator Co.

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This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in PLASTICS. Please mention PLASTICS when writing to these firms.

And Now, In Closing:

WHAT a sick head business has! . . . the result, perhaps, of a swelled one a year ago . . . it needs, among many things, a return to sanity . . . Armstrong Cork takes over the sale of closures for Mack . . . And there's a lot of discussion about it . . .Tinged with pleasure, you might say . . . Harry Randall gets fined $10 in traffic court on Friday the 13th . . . A new urea compound about to come on the market . . . Alden definitely out, thereby opening the summer bankruptcy season . . . The rumor about du Pont . . . if it were only a rumor! . . . Another one; that Continental Diamond gets in with Fibroc. . . The argument that Savings Bank deposits are not true indices of business . . . The rebuttal that personal ones are . . . O'Koomian of Modern Molded is interested in this new Triad pen and pencil . . . this is the implement that doesn't roll off your desk . . . what's really needed is a non-leakable pen . . . Hope W. L. Kelley has recovered from his southern trip . . . Henry W. Peabody seems interested in plastics . . . Is now handling sales for both Aldur and Makalot . . . Molded sales two-thirds under last year; one-third under '28 . . . Four molders average 8% more sales . . . and 4.75% less profit . . . the button business knocked sky high . . . We look for a disturbing situation in closures . . . and, because of Armstrong, a lot of thought on liners . . . St. Louis sees some price cutting . . . understand the G. E. artificial lightning display cost $125 for electricity alone . . . we'll see a few "out of business" signs in the next quarter.

WITH all the current talk on association advertising, we wish to rise to say that in spite of the publicity and paid advertising devoted to dentists, tooth brushes, mouth washes, dental floss, etc., four out of five people in these allegedly United States do not brush their teeth regularly. It seems impossible, but it's true. Why don't the pyroxylin manufacturers start some institutional copy on this one line?

THEN, too, there is talk on price cutting. It is interesting to note that Major Benj. H. Namm, head of the Namm Store, Brooklyn has stated that Listerine is the most cut-priced article in the retail trade. This may explain something mentioned in our "stacatto stuff."

IT seems hardly believable that Stewart Clarkson has left his connection with Nema and hence with the Molded Section. Yet when that is believed, one wonders to what extent the molders adopted a defensive attitude! Certainly no one, to our knowledge, had the courtesy and initiative to express what everyone in the industry must feel: That Mr. Clarkson was entitled to a vote of thanks from the Section for his work in its behalf. Regardless of whether that work was entirely successful—and we have our opinions—Mr. Clarkson gave freely of his time and knowledge. A mere expression would have softened, somewhat, the bad taste of the aftermath. Most men, more humanly inclined, would do as much for a $30 a week press hand.

We wouldn't devote a second paragraph to this subject merely because it has already reacted unfavorably in other quarters. The main point, in our humble opinion, is that this lack of action shows how definitely the humanizing influence is forgotten and neglected in this industry where, above all else, it is so terribly needed.

ALL around us, in this industry, we hear prolonged and agonized cries on business; that "it is a strong buyer's market" and "puts price before quality in an effort to cheapen cost." No one doubts the truth of these statements, yet no one, on the other hand, offers any remedy. It is apparent that the present situation has been caused by those within this industry; that the cut-price buyer's market can be laid to the molder, fabricator and material manufacturer. Reasons for it —lack of organization, cut-prices on materials (caused in part, by molder or fabricator), over equipment, misplaced confidence, ignorance of proper method, etc.—can be rattled off by the score. Solutions for it are a different thing entirely.

We believe, however, that the fundamental principles are of foremost importance; that rules are made to be obeyed; that executives should execute; that sales should be in the hands of salaried representatives; that cost should be in the hands of accountants; that equipment should be more standardized; that industry subsidy should be eliminated and adequate capital established; that brains, imagination, initiative and knowledge are the natural aids to profit. Simple, isn't it? Yes, in theory, but practice, in this industry seems to involve many committees, much time and waste motion. These are precepts that are ideally suited to individual action.

So we believe that when individual's actions are freed from secret consultations and based on sane procedure, we can all prosper.